

# SAE *Journal*

Published Monthly by The Society of Automotive Engineers, Inc.

A. T. Colwell, President

David Beecroft, Treasurer

John A. C. Warner, Secretary and General Manager

Norman G. Shidle, Executive Editor



## About Authors

■ **FRANK W. KAVANAGH** (M '36) has specialized in lubrication for the past ten years as research engineer with the Standard Oil Co. of Calif. He is the designer of a number of testing machines and has been active in the development of improved lubricants. He now is assistant in charge of the company's Lubrication Research Laboratory at Richmond, Calif. Mr. Kavanagh graduated from the U. of California with the Class of '30.

■ **W. J. McCORTNEY** (M '39) began his work on rubber with the B. F. Goodrich Co. in 1927. At that time bonding of rubber to metal was becoming of extreme interest to the automotive industry and it was one of the problems upon which he worked. Partly because of this experience, he was employed by the Chrysler Corp. in 1929 to start the first completely equipped rubber laboratory in the automotive industry. Shortly after this, synthetic rubbers appeared on the market, and the Chrysler laboratory pioneered in their application in the manufacture of automobiles, and had much to do in bringing them to their present state of usefulness. Mr. McCortney is now engineer in charge of the Chrysler Rubber and Plastics Laboratory that deals with both natural and synthetic rubbers, plastics, adhesives, and similar materials.

■ After graduating with distinction from the U. S. Naval Academy at Annapolis in 1930, **LLOYD H. MULIT** (M '33) went to Bayonne, N. J., as research engineer for the Tidewater Oil Co. In 1934, he left there to become research engineer for the Standard Oil Co. of Calif., where his present activities include supervision of the Lubrication

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Research Laboratory at Richmond, Calif. The laboratory is engaged in the development of all types of lubricants, as well as in laboratory tests of all

kinds, engine tests, and field tests in equipment distributed throughout the United States.

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**C. B. Whittelsey, Jr., Business Manager,**  
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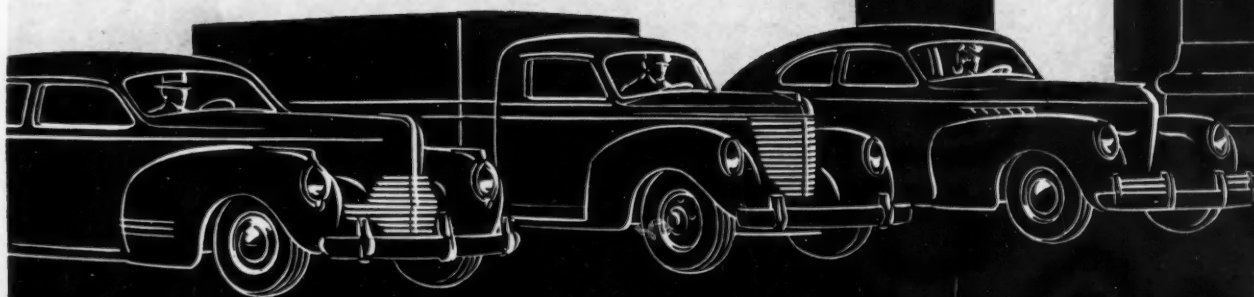
**BENDIX**

All the car and truck selling isn't done by salesmen. People have opinions and convictions of their own—ideas they have acquired by experience. Even the most "un-mechanical" folk frequently arrive at conclusions about cars which no amount of argument or persuasion can shake.

They may not be able to read a graph of torque and horsepower development; they may see little significance in technical data of vast importance; but they recognize instantly a trusted, respected name—a name like Bendix Brakes or Stromberg Carburetors, for instance! And such recognition is a pretty powerful persuader as to the excellence of the other engineering features.

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*of Bendix Aviation Corporation • South Bend, Indiana*

# TRUCK CARRYING-CAPACITY RATING

## Maximum Gross Vehicle Weight Indicated as Basis for Licensing

*Report of the SAE Motor Truck Rating Committee*

■      ■      ■

**W**ITH the publication of the accompanying report on carrying-capacity ratings, the SAE Motor Truck Rating Committee completes the second phase of its work. The first phase resulted in the report on ability rating which was published in the January, 1940, issue of the SAE Journal, pages 11-15.

The information, which these two reports recommend be provided, gives a complete general idea of the capabilities of any given truck chassis.

Both reports have been transmitted to the Motor Truck Committee of the Automobile Manufacturers Association which early in 1938 requested the Society to undertake this work. In accordance with this request Council approved the appointment of the present Motor Truck Rating Committee which succeeded a committee of the same name that was organized in 1932.

The two reports developed by the present committee, of course, supersede the tentative report developed by the earlier committee, which was published in the March, 1933, issue of the SAE Journal, pages 14-16.

■      ■      ■

**T**HE carrying capacity of a motor truck is the end product of the almost innumerable elements of its design and construction. It is the integration of the carrying capacities of the tires, wheels, bearings, axles, springs, steering system, brakes, frame, engine, etc., and the many parts of these major components. Ideally it would be desirable to rate carrying capacity by means of an engineering criterion, or formula, which would integrate this multitude of complex elements and give an answer entirely objective in character. Unfortunately no such criterion is available and, if an acceptable one could be developed, it would be exceedingly complicated. It consequently would not have the requisite characteristics of simplicity and understandability, and thus would be without practical usefulness.

Lacking such a criterion, the Rating Committee believes that the most satisfactory alternative is for the manufacturer to rate the carrying capacity of his own products and that, for the worth-while benefits to be derived from uniformity, the form of rating should follow a standardized pattern. This would require each manufacturer to provide the same information about the carrying capacity of his trucks. This information, however, would not necessarily be entirely comparable because of the variations in the bases on which different manufacturers rate their products as determined by their own design and selling policies.

With this background, the Rating Committee presents its recommendations for a uniform method of rating the carrying capacities of motor trucks.

The carrying capacity should be rated by the following terms:

1. Maximum Gross Vehicle Weight ..... pounds.
2. Maximum Gross Combination Weight ..... pounds.
3. Maximum Gross Carrying Capacity ..... pounds.
4. Maximum Authorized Tire Equipment .....
5. Structural Chassis Weight ..... pounds.

The above terms which, taken together, give the capacity rating of a truck, are defined as follows:

1. Maximum Gross Vehicle Weight is the weight in pounds of a truck chassis with lubricants, water and full tank or tanks of fuel, plus the Maximum Gross Carrying Capacity as defined below.

2. Maximum Gross Combination Weight is the Maximum Authorized Gross Weight in pounds of a tractor



truck and any combination of trailers. It is made up of the sum of the weights of all chassis (including tractor-truck and trailer), cab, lubricants, water, full tank or tanks of fuel, all bodies, special chassis and body equipment, attaching parts and payload.

3. Maximum Gross Carrying Capacity is the maximum authorized weight in pounds which may be superimposed upon a truck chassis when equipped with the maximum authorized number and size of tires. It is equal to the sum of the weights of cab, body, special chassis and body equipment, and payload.

4. Maximum Authorized Tire Equipment means the size, number of plies and number of tires on the load carrying wheels of the prime mover which, in accordance with Tire & Rim Association Standards, is the maximum in capacity authorized by the manufacturer.

5. Structural Chassis Weight is the weight in pounds of a truck chassis without lubricants, water and fuel, less the weight of tires, radiator (including shell and grille), engine, clutch, transmission and propeller shaft assemblies.

## DISCUSSION

**Maximum Gross Vehicle Weight**—This figure is of primary importance as a basis for licensing since it is an index of highway use. Gross vehicle weight also is necessary for the determination of potential ability and for determining tire equipment. Ability factor in pounds per horsepower is obtained by dividing the Maximum Gross Vehicle Weight by the Certified Net Horsepower. By subtracting gross carrying capacity, chassis road weight is obtained.

**Maximum Gross Combination Weight**—This weight is the total which is authorized to be moved by a tractor truck and is required in ability calculations. In the case of a tractor pulling a trailer or combination of trailers, the ability factor in pounds per horsepower is obtained by dividing the maximum gross combination weight by the certified net horsepower.

**Maximum Gross Carrying Capacity**—This figure obviously is an essential element of any rating since carrying capacity is the user's primary concern. While he is primarily interested in payload, the gross figure is recom-

mended for the reason that the portion of the gross carrying capacity absorbed by body and equipment is subject to wide variation according to the kind and conditions of service to which the truck is to be applied. The purchaser of a chassis presumably knows the weight of the payload and the body and equipment required to accommodate it. He seeks a chassis adequate in capacity to carry this total load. Knowing the weight of cab, body and equipment in each instance, the payload can be derived readily from the gross carrying capacity.

**Maximum Authorized Tire Equipment**—Tire capacity should be adequate for the gross vehicle weight, it being assumed that the weight is distributed approximately equally among the tires. This assumption is not realized in practice much of the time, but the disparity is steadily becoming less and it is accordingly believed that it is justified for rating purposes.

**Structural Chassis Weight**—The exact analysis of any structure, such as a motor truck chassis, with respect to strength involves so many factors and such intricate calculations as to be entirely beyond the range of practicability in the process of rating. This figure is somewhat indicative of the structural adequacy of the chassis.

### ■ Relation of Capacity Rating to Ability Rating

The information conveyed by the five factors used as a basis for the capacity rating, taken in conjunction with the information required for the ability rating, gives a complete general idea of the capabilities of any given truck chassis.

In addition to the capacity factors, the maximum certified horsepower and the r.p.m. at which it occurs are necessary to evaluate the all-around ability of a truck and to compute the ability factor.

It is recommended that this information at least be presented by means of a plate upon which the six factors required for both ability rating and capacity rating are shown.

The form for such a plate recommended herein provides spaces only for the items recommended by this Committee. Individual manufacturers may, of course, desire to expand the minimum information provided by the recommended plate by adding other items descriptive of the vehicle.

#### (MANUFACTURER'S NAME AND ADDRESS)

MODEL .....	CHASSIS NO. ....
<hr/>	
CERTIFIED NET HORSEPOWER .....	at ..... R.P.M.
MAXIMUM GROSS VEHICLE WEIGHT .....	POUNDS
MAXIMUM GROSS COMBINATION WEIGHT .....	POUNDS
MAXIMUM GROSS CARRYING CAPACITY .....	POUNDS
MAXIMUM AUTHORIZED TIRES .....	
	No.                      Size                      Plies
STRUCTURAL CHASSIS WEIGHT .....	POUNDS





## National Defense Program Depicted by President Colwell on Visits to Sections

**W**ARNING against both prophets of doom and unjustifiable optimism, SAE President A. T. Colwell gave more than 1000 members of the Society a "behind the scenes" account of progress being made in America's national defense program, as he visited six eastern Sections in January and February. Accompanied by SAE General Manager John A. C. Warner, Mr. Colwell was guest speaker at the Metropolitan Section, Jan. 16; Syracuse, Feb. 10; Canadian, Feb. 12; Indiana, Feb. 14; Detroit, Feb. 24; Chicago, Feb. 25, and Kansas City, Feb. 26. Record crowds turned out to welcome the newly elected president, braving unpleasant weather in some sections.

Mr. Colwell traced specifically the flow of widespread research and development work of scientists in the medical, engineering, metallurgical, chemical and other fields toward the reservoir of national defense through the coordinating efforts of the Society and other national organizations. High altitude fighting, he pointed out, would have reached its limit long ago had not the medical profession gone far in providing respiratory equipment for pilots and aircraft gun crews.

He decried those defeatists who say that only in a totalitarian state can Germany's amazing mass production of armaments be equaled, and pointed out that while the peace-loving democracies were developing management, engineering, production and research techniques in commercial pursuits, Hitler alone was gearing the whole of a nation to the manufacture of airplanes, tanks, submarines, and other weapons. However, the experiences and techniques known by American industry already have made possible potential production which will outstrip anything that has been accomplished overseas, he declared.

"War is the only test for the effectiveness of any weapon. Only when our army officers saw the relative effectiveness of tanks in actual combat could they know what designs would be the most effective. Our tank production program, based on the experience gained abroad as to types and numbers, is well on its way," he said, pointing out the great advantage the United States has today because of long experience in this phase of automotive engineering.

"The same is true in respect to aircraft. No one believes that today's best design and today's manufacturing techniques will be

the standard for all time. We are building the best engines and airplanes we can, but as the fighting in Europe progresses we will see the need for changes in design. And in the meantime, our production men will have developed faster and cheaper methods for building aircraft.

"Remember," Mr. Colwell continued, "that all of us thought the Hitlerism of six and seven years ago was bluff. German officials openly bragged about their armament capacity, but most of the rest of the world thought that this was only a part of his bluff to gain his ends through diplomatic victories.

"But Hitler sold the German people on the age-old Germanic philosophy that the highest attainable profession was that of a warrior. We, on the other hand, are a nation of amateurs in respect to war—but we are professionals at mass production.

"All of our technical and natural resources are being tapped to compete with the whole German economic system which was built for and applied to armaments. Against this we will compete and already have begun to compete successfully. I believe we can achieve the goal without seriously dislocating our national economy," he said.

Because war today is fought on wheels and wings, America is in a position to aid the Allies because in the business of building automotive equipment we have no peer, Mr. Colwell stated. Furthermore, he said, England and America are countries of free men and women, and Germany and Italy are not. It takes spirit, as well as equipment, to win, he added.

Discussing the so-called raw material bottlenecks, Mr. Colwell described the work that already has been accomplished and other developments in progress to furnish substitutes for most of the things our present

armament program requires. Thousands of tons of tin are being saved by new methods of fabricating and lacquering tin cans for foods; available minerals can readily be used as substitutes for those which are more necessary for fighting equipment than for industrial purposes; synthetics can in many instances displace natural products, such as rubber.

### Bomb Sight Accurate

"The American bomb sight is today accurate enough to hit a 50-ft circle at 18,000 ft, with the result that millions of dollars are being spent by the Navy to protect battleships," Mr. Colwell said, continuing: "The nation which can command the seas wins battles, and that is being done by Britain in the air and in the water.

"It is paradoxical that a manufacturer is called upon to make armor plate that will withstand a gun of a given caliber, and then gets an order to make a projectile to pierce the armor plate," he remarked. "But that is the essence of engineering, and the American manufacturing industries have been making similar paradoxes commonplace for years.

"It has always been a race between aircraft designers, engine designers, parts designers, and gasoline refiners. This race is being stimulated by the World War experiences," he said, and described briefly some of the new aircraft, engines, parts, fuels, armament, and fire-power he recently has seen or learned about.

"About thirteen years ago, in 1927, Lindbergh flew across the Atlantic and astounded the world. Today flying is the safest way to cross the Atlantic," he said, declaring his confidence of continued developments in man's conquest of the air.

### Metropolitan Discussion

Questions were numerous as the different Sections opened their meetings for discussion. At the Metropolitan Section, where Past President Nutt was in the chair in the absence of Section Chairman Rudolph F. Gagg, discussion was opened by Dr. B. J. Lemon who pointed out that little has been actually done in reclaiming used rubber, of which there are millions of tons available should we actually face a shortage. In the meantime, he said, widespread research has been done in the field of synthetic rubber.

In answer to T. C. Smith, Mr. Colwell estimated that about 70% of the German people believe that Germany will win. These, however, are the younger portions of the population, and are those who are profiting, both in payrolls and prestige, in the present "war economy" of the country. None of those who fear the eventual outcome, or criticize Hitler's methods, dare to speak, he added, citing examples of this fear which has choked opposition.

A great deal of "freezing" of designs and standardization of aircraft, aircraft engine, tanks, guns, and other equipment has already been effected in the defense program, Mr. Colwell said in answer to a question raised by Norman G. Shidle. However, he added, there is increased, rather than decreased, research and development work going on all the time.

Mr. Colwell reported that vehicle maintenance work, including the adoption of mobile repair shops, already has been begun by the Army. Some 6000 men are being trained to keep the equipment in the best possible condition, he said, in answer to a question by T. L. Preble. "In this, as in other phases of the Society of Automotive

Engineers' work, we are ready to furnish all the aid the government calls for," he said, referring to the several hard-working committees of the Society which are already cooperating with the Army, Navy, and other branches of the government.

Joseph Tracy, who with William P. Kennedy and Arthur J. Moulton of the Metropolitan Section had been voted to Life Membership in the Society, was present at the Jan. 16 Metropolitan Section meeting to receive his certificate. The above Metropolitan Section members were among the six Founder Members of the Society who were voted Life Membership by the Council in July 1940. Presentation was made at the Annual Meeting (See SAE Journal for February, 1941, page 21).

#### ■ Canadian Welcome

Officers of the Royal Air Force, Royal Canadian Air Force, and the Canadian Army, including Col. F. F. Worthington, O.C. of Canada's Armored Division, and ranking executives of other engineering societies in Canada were among the two hundred-odd members and guests of the Canadian Section who attended the dinner to welcome SAE President A. T. Colwell and General Manager John A. C. Warner at the Royal York Hotel, Toronto, Feb. 12.

The chairman of the Section, Norman H. Daniel, presided. Host at the receptions preceding and following the meeting was the Canadian National Carbon Co., Ltd.

Marcus L. Brown, Jr., immediate past chairman of the Section, welcomed Mr. Warner to the meeting with reference to the

Society's valuable contributions to the national defense program of the United States—a theme Mr. Warner elaborated when he in turn introduced President Colwell on behalf of the Canadian Section.

## 1941 Roster Reflects Activity of Industry

Bound in its blue and buff cover, the 1941 SAE Roster early this month will be en route to members who requested copies.

An increased number of revisions in the new Roster reflects growing activity within the industry which has brought promotions and changes of company connections to many members of the Society. It also re-

(News of Society continued on page 28)

# SAE Coming Events

**March 13 - 14**

National Aeronautic Meeting  
Washington Hotel - Washington, D. C.

**May 12 - 13**

National Production Meeting  
Schroeder Hotel - Milwaukee, Wis.

**June 1 - 6**

Summer Meeting  
The Greenbrier - White Sulphur Springs, W. Va.

**Sept. 25 - 26**

National Tractor Meeting  
Schroeder Hotel - Milwaukee, Wis.

**Oct. 30 - 31 & Nov. 1** National Aircraft Production Meeting  
Biltmore Hotel - Los Angeles, Calif.

#### Baltimore - March 11

Engineers Club; dinner 6:30 p.m. Behind the Scenes in National Defense Engineering - A. T. Colwell, vice president, Thompson Products, Inc., and president, SAE. Guest - John A. C. Warner, secretary and general manager, SAE.

#### Buffalo - March 13

Markeen Hotel; dinner 6:30 p.m. Diesels - P. E. Biggar, executive engineer, General Motors Truck & Coach Division, Yellow Truck & Coach Manufacturing Co.

#### Canadian - March 19

Royal York Hotel, Toronto; dinner 6:30 p.m.

#### Chicago - April 1

Chicago Towers Club; dinner 6:45 p.m. Truck, Bus and Railcar Meeting. Speaker - A. W. Scarratt, vice president, engineering and patents, International Harvester Co. Regularly called Business Session of SAE Tractor & Industrial Activity Committee for election of members to Activity's Nominating Committee.

#### Cleveland - March 10

Cleveland Club; dinner 6:30 p.m. Applications of Electrical Power in Aircraft - T. B. Holliday, electrical engineer, electrical equipment division, Wright Field.

#### Detroit - March 10 & 31

March 10 - 12:30 p.m. Luncheon at Chrysler Corp. followed by trip through Chrysler Laboratories. 5:00 p.m. Talk by P. J. Kent, chief electrical engineer, Chrysler Corp. Hotel Statler; dinner 7:00 p.m. Development of an Advertising Program - Lee Anderson, president, Lee Anderson Advertising Agency.

March 31 - Hotel Statler. Static Fatigue of Rubber - Dr. S. M. Cadwell, director of tire development, U. S. Rubber Co.

#### Indiana - March 14

Antlers Hotel, Indianapolis; dinner 6:45 p.m. Speaker: E. S. Hall, manager and chief engineer, Round Engine Patents.

#### Metropolitan - March 12

Hotel New Yorker; dinner 6:30 p.m. Closed meeting for SAE members only. Our Automotive Industry in National Defense -

A. W. S. Herrington, president, Marmon-Herrington Co., Inc.

#### Milwaukee - March 14

Place to be announced; dinner 6:30 p.m. Tanks and Other Automotive Equipment - Lt.-Col. H. W. Rehm. Movies - Magic of Modern Plastics.

#### New England - March 11

Engineers Club, Boston; dinner 6:30 p.m. Engine Design as Affecting Lubrication and Fuel Behavior - R. J. S. Pigott, staff engineer, Gulf Research & Development Co.

#### Northern California - March 11

Hotel Leamington, Oakland. Subject: Fuels and Lubricants.

#### Northwest - March 21

Tacoma. Subject - Motor Transportation in the Army.

#### Oregon - March 21

Auditorium, Public Service Bldg., Portland. Meeting 8:00 p.m. Marine Equipment - Captain Walter Elliott. Showing of marine pictures by Mr. Forest Ginn.

#### Philadelphia - March 12

Penn Athletic Club; dinner 6:30 p.m. Engine Design vs. Engine Lubrication - R. J. S. Pigott, staff engineer, Gulf Research & Development Co.

#### Pittsburgh - March 18

Webster Hall; dinner 6:30 p.m. Behind the Scenes in National Defense Engineering - A. T. Colwell, vice president, Thompson Products, Inc., and president, SAE. Guest - John A. C. Warner, secretary and general manager, SAE.

#### St. Louis - March 25

Candlelight House. High Speed Diesel Engines - C. G. A. Rosen, assistant chief engineer, charge of diesel research, Caterpillar Tractor Co.

#### Southern California - March 14

Dinner Dance.

#### Southern New England - March 5

Hotel Bond, Hartford; dinner 6:30 p.m. The Design and Application of Oil Hydraulic Units for the Transmission of Power - K. R. Herman, vice president, Vickers, Inc.

#### Washington - March 13 & 14

Washington Hotel, Washington, D. C. Participation in the National Aeronautic Meeting of the Society.

# NEW MEMBERS Qualified

These applicants who have qualified for admission to the Society have been welcomed into membership between Jan. 15, 1941, and Feb. 15, 1941.

The various grades of membership are indicated by: (M) Member; (A) Associate Member; (J) Junior; (Aff.) Affiliate Member; (SM) Service Member; (FM) Foreign Member.

## Baltimore Section

Bill, Robert George (J) assistant to research engineer, Koppers Co., American Hammered Piston Ring Division, Bush & Hamburg Sts., Baltimore (mail) 2705 Maisel St.

## Buffalo Section

Glendenning, William J. (J) machinist, mechanical engineer, Houde Engrg. Corp., Buffalo (mail) 9 Franklin St., Batavia, N. Y.

Woods, Robert J. (M) chief design engineer, Bell Aircraft Corp., 2050 Elmwood Ave., Buffalo.

## Canadian Section

Hosie, Alexander W. (A) fleet superintendent, Christie Brown & Co., Ltd., 202 King St., East, Toronto, Ontario (mail) 4 Edgewood Gardens.

Kelton, John Thomas (J) mechanical engineer, Ford Motor Co. of Canada, Windsor, Ontario. (mail) 1092 Monmouth Road, Walkerville, Ontario.

## Chicago Section

Balis, Moorman Randall (J) research engineer, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind. (mail) 507 West Washington.

Bond, John R. (J) transmission layout, Studebaker Corp., South Bend, Ind. (mail) 709 N. St. Joseph St.

Durrstein, Vernon Lewis (M) chief draftsman, Buda Co., Harvey, Ill. (mail) 15639 Marshfield.

Hansen, Zenon C. R. (A) national account representative, International Harvester Co., 611 W. Roosevelt Road, Chicago.

Renouf, Rolfe (M) Renouf Motors, Warrenville, Ill. (mail) Lock Box 174, Wheaton, Ill.

Wuestenberg, H. C. (A) service manager, Austin-Western Road Machinery Co., 601 Farnsworth Ave., Aurora, Ill. (mail) 535 Downer Place.

## Cleveland Section

Brown, Edward F. (J) sales engineer, Ohio Ball Bearing Co., Cleveland (mail) 6531 Euclid Ave.

Brown, Robert T. (M) engineer, Good-year Tire & Rubber Co., Akron, O.

Church, Heyliger (A) manager, airplane division, Weather Co., 300 E. 131st St., Cleveland.

Compton, James A. (J) checker, Pump Engrg. Service Corp., 12910 Taft Ave., Cleveland (mail) 1472 E. 134th St., East Cleveland.

Dinsmore, Ray Putnam (M) manager, development department, Goodyear Tire & Rubber Co., Akron, O.

Dudley, Winston M. (J) instructor, Case School of Applied Science, 10900 Euclid Ave., Cleveland.

Gano, Kenneth C. (M) engineer, Leece-Neville Co., 5363 Hamilton Ave., Cleveland.

Lindberg, Paul G. (J) draftsman, Pump Engrg. Service Corp., 12910 Taft Ave., Cleveland (mail) 1733 Hartshorn Road, East Cleveland.

Moore, Guy Richard (A) sales department, Thompson Products, Inc., 2196 Clarkwood Road, Cleveland.

Pasco, Theodore Guthrie (J) assistant service engineer, Leece-Neville Co., 5363 Hamilton Ave., Cleveland (mail) 2304 Bellfield Road, Cleveland Heights.

Rounds, Robert (A) contact engineer, A. Schrader's Son, 05 Johnston St., Akron, O. (mail) 221 N. Portage Path.

Thorne, Marion F. (J) engineer, Thompson Products, Inc., Cleveland (mail) 3638 Lee Road.

Wallace, Robert B. (J) test engineer, Pump Engrg. Service Corp., 12910 Taft Ave., Cleveland (mail) 12813 Detroit Ave., Lakewood, O.

Weekes, Charles P. (A) vice president, Hercules Motors Corp., 11th St., Canton, O.

Zuske, Harold J. (J) engineer, Leece-Neville Co., 5363 Hamilton Ave., Cleveland (mail) 18901 Mitchell Ave., Rocky River, O.

## Detroit Section

Ayres, Vincent (J) engineer, Wilcox-Rich Division, Eaton Mfg. Co., 9771 French Road, Detroit.

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Millet, John P. (J) draftsman, Packard Motor Car Co., Detroit (mail) 1410 W. Grand Blvd.

Nicoletti, George W. (A) sales engineer, New England High Carbon Wire Co., Millbury, Mass. (mail) 16212 Ward, Detroit.

Pope, Winslow B. (M) designer, Budd Wheel Co., 12141 Charlevoix, Detroit (mail) 4120 Haverhill.

Rabb, Wm. C. (A) service representative, Ford Motor Co., Dearborn, Mich.

Turkish, Michael Charles (J) engineering draftsman, Wilcox-Rich Division, Eaton Mfg. Co., 9771 French Road, Detroit (mail) 17109 Hickory St.

Wobrock, Marvin T. (M) designer, Chevrolet Motor Division, General Motors Corp., Detroit (mail) 13885 Collingham Drive.

## Indiana Section

Brantingham, Paul T. (M) assistant chief engineer, International Harvester Co., Fort Wayne, Ind. (mail) 4818 Calumet St.

Zollner, Fred (M) vice president, Zollner Machine Works, Fort Wayne, Ind.

## Kansas City Section

Helling, F. H. (A) secretary, treasurer, Penn-Central Oil Co., Kansas City, Kans. (mail) 609 S. 20th.

Hooper, W. H. (M) division engineer, Phillips Petroleum Co., Kansas City, Mo. (mail) 4705 Central.

## Metropolitan Section

Bleyle, George Alfred (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) 201 Abbott Road, Radburn, N. J.

Crossette, Murray Fisher, Jr. (J) supervisor, service technical publications division, Wright Aeronautical Corp., Beckwith Ave., Paterson, N. J. (mail) Beach Terrace, Pines Lake, R.F.D.

Harrison, Marvin (J) vibration engineer, Curtiss-Wright Corp., Curtiss Propeller Division, Clifton, N. J. (mail) 143 Montclair Ave., Montclair, N. J.

Hauser, Alexander (A) vice president, Wrought Bearing Metals, Inc., 230\* Park Ave., New York.

Hayden, Christopher J., Jr. (A) treasurer, Hayden Automobile Co., 747 Main St., Stamford, Conn. (mail) care of Stamford Library, Broad St.

Hey, Lester E. (J) experimental engine tester, Wright Aeronautical Corp., Paterson, N. J. (mail) 523 14th Ave.

Karl, John M. (A) president, Karl Brothers, Inc., 95 Elm St., New Canaan, Conn.

Mehrhof, Kenneth C. (J) engine tester, Wright Aeronautical Corp., Paterson, N. J. (mail) 18 Laurel Place, Glen Ridge, N. J.

Plackwic, Edmund S. (J) production engineering, Wright Aeronautical Corp., Paterson, N. J. (mail) 15 Montclair Ave.

Rogers, John DeWitt, Jr. (J) experimental engine tester, Wright Aeronautical Corp., Paterson, N. J. (mail) 166 Gordonhurst Ave., Upper Montclair, N. J.

St. Aubin, Roland W. (J) apprentice mechanic, American Air Lines, Inc., LaGuardia Field, Jackson Heights, L. I., N. Y. (mail) 242 Bennett Ave., Hempstead Heights, Hempstead, L. I., N. Y.

Saltzer, Bertram Hanson (M) supervisor of engineering training, Wright Aeronautical Corp., Paterson, N. J. (mail) 225 Oak St., Ridgewood, N. J.

Schroeder, Robert W. (J) test engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) 22 86th St., Brooklyn, N. Y.

Scott, Robert William (J) junior engineer, Wright Aeronautical Corp., Paterson, N. J. (mail) 44 Gates Ave., Montclair, N. J.

Stork, Charles Theodoor (A) buying representative, Stork Bros. & Co., N. V., Soerabaja, Netherlands East Indies (mail) 9 Rockefeller Plaza, New York.

Stram, George H. (J) layout draftsman, Lawrence Engrg. & Research Corp., Vreeland Mills Road, Linden, N. J. (mail) 212 E. Price St.

Strunk, Kenith G. (M) chief engineer, Breeze Corporations, Inc., 41 S. Sixth St., Newark, N. J.

## Milwaukee Section

Foley, Robert A. (M) research engineer, Hevi Duty Electric Co., 4212 Highland, Milwaukee (mail) 8134 Hillcrest Drive, Wauwatosa, Wis.

Johnson, Roy A. (M) designing engineer, Allis Chalmers Mfg. Co., Milwaukee (mail) 519 N. 17th St.

## New England Section

Mercier, Alonzo P., Capt. (J) 208th Coast Artillery (A.A.), Camp Edwards, Mass.

Osborn, Henry Clay, III (J) experimental test engineer, Pratt & Whitney Aircraft, Division of United Aircraft Corp., East Hartford, Conn. (mail) Main Road, Tiverton, R. I.

(Concluded on following page)



### Northern California Section

Glade, Peter (M) superintendent of equipment, Purity Stores, Ltd., San Francisco (mail) 324 Avila St.

### Northwest Section

McLean, Allan Dunbar (J) draftsman, Kenworth Motor Truck Corp., 1263 Mercer St., Seattle, Wash. (mail) 12705 Bothell Way.

Ritter, Harry A. (A) superintendent of equipment, Tacoma Railway & Power Co., Tacoma, Wash. (mail) 1306 A Street.

### Philadelphia Section

Borowsky, A. G. (M) president, George K. Garrett Co., D & Tioga Sts., Philadelphia (mail) 1421 Chestnut St.

Ellis, Brower R. (J) patent engineer, Mack Mfg. Corp., Allentown, Pa.

Greene, O. V. (M) assistant metallurgist, Carpenter Steel Co., Reading, Pa.

Haus, Luther R. (J) charge, experimental test, Mack Mfg. Corp., Allentown, Pa. (mail) 941 Hamilton St.

Jacobs, Albert R. (M) vice president, chief engineer, Jacobs Aircraft Engine Co., 750 Queen St., Pottstown, Pa.

McKee, William Maxwell (M) automotive research and testing, Sun Oil Co., Marcus Hook, Pa. (mail) 532 Mohawk Ave., Norwood, Pa.

Wright, W. Andrew (M) development engineer, Sun Oil Co., Development Division, Marcus Hook, Pa.

### Pittsburgh Section

Donaldson, Holland H., Jr. (J) research chemist, Gulf Research & Development Co., Drawer 2038, Pittsburgh, Pa. (mail) 5614 Howe St.

Murphy, Thomas G. (M) chief chemist, Franklin Creek Refining Corp., Franklin, Pa.

Pratt, Samuel F. (A) assistant executive secretary, Pennsylvania Grade Crude Oil Assn., Oil City, Pa. (mail) P. O. Box 96.

### St. Louis Section

Adolphson, Roy T. (M) engineer, Sunnen Products Co., 7900 Manchester St., St. Louis, Mo.

### Southern California Section

Cooper, Earl P. (M) chief automotive engineer, Union Oil Co. of Calif., 617 W. Seventh St., Los Angeles.

Heinemann, Edward H. (M) chief engineer, Douglas Aircraft Co., Inc., El Segundo, Calif. (mail) 3815 Crestway Place, Los Angeles.

Klose, Alfred Julius (M) engineer, charge of design room, Vultee Aircraft, Inc., Vultee Field, Downey, Calif. (mail) 931 Walnut, Inglewood, Calif.

Russell, Edward Stuart (A) tool designer, Vega Airplane Co., Burbank, Calif. (mail) 912 E. Acacia Ave., Glendale, Calif.

Schwimmer, James Franklin (J) engineer, Kinner Motors, Inc., Glendale, Calif. (mail) 1347 Colton St., Los Angeles.

Simmons, Edward E., Jr. (J) research assistant, California Inst. of Technology, Pasadena, Calif.

Wood, Homer Jesse (J) project engineer, Menasco Mfg. Co., Burbank, Calif. (mail) 3055 1/2 Hollywood Drive, Hollywood, Calif.

### Southern New England Section

Decds, Charles W. (A) president, Chandler-Evans Corp., South Meriden, Conn.

Haynes, Nathaniel (M) designer, Pratt & Whitney Aircraft, Division United Aircraft

Corp., East Hartford, Conn. (mail) 218 Tryon St., South Glastonbury, Conn.

Johnson, Joseph C. (J) ignition test engineer, Pratt & Whitney Aircraft, Division United Aircraft Corp., East Hartford, Conn. (mail) 95 West Middle Turnpike, Apt. 9, Manchester, Conn.

Millen, Linwood F. (J) detailer, Pratt & Whitney Aircraft, Division United Aircraft Corp., Main St., East Hartford, Conn. (mail) 96 Webster St., Hartford, Conn.

Ortner, Henry, Jr. (A) head instructor, fuel injection equipment school, American Bosch Corp., 3664 Main St., Springfield, Mass. (mail) 3249 Main St.

### Washington Section

Allan, James A. (A) manager, Allied Suppliers, Inc., Room 333, Southern Bldg., 15th & H Sts., N.W., Washington.

Knauff, William K. (SM) chairman, technical advisory board, U. S. Dept. of Agriculture, Office of Plant & Operations, Technical Advisory Board, Washington (mail) 3500 14th St., N.W., Apt. 706.

Nelson, Fredric A. (J) layout man, Glenn L. Martin Co., Baltimore, Md. (mail) 4618 N. Dittmar Road, Arlington, Va.

Sanders, John Clayton (J) junior mechanical engineer, National Advisory Committee for Aeronautics, Langley Field, Hampton, Va. (mail) 124 Armistead Ave.

Wasielewski, Eugene W. (SM) assistant engineer, National Advisory Committee for Aeronautics, Langley Field, Hampton, Va. (mail) 113 Pochin Place.

Watson, James A., Jr. (M) proprietor, Watson Automotive Equipment Co., Hill Bldg., 839 17th St., N.W., Washington.

Wyatt, Owen T. (M) service engineer, Aero Spark Plug Co., Inc., 635 Greenwich St., New York (mail) Box 212, Berwyn, Md.

### Outside of Section Territory

Bailey, William E. (M) experimental engineer, Lycoming Division, Aviation Mfg. Corp., Williamsport, Pa. (mail) 2600 Grand St.

Carpenter, J. H. (M) assistant project engineer, Aviation Mfg. Corp., 1515 Park Ave., Williamsport, Pa. (mail) 600 Harding Ave.

Partlan, Thomas L. (A) teacher, Board of Education, Kingston High School, Kingston, N. Y.

Reger, Chris C., Major (SM) Quartermaster Corps, Fort Bliss, Tex.

Reinberg, Henry C. (A) chemical engineer, State of Louisiana, Dept. of Revenue, Motor Fuel Laboratory, Baton Rouge, La. (mail) 840 East Blvd.

Smith, Donald W. (M) dynamometer test engineer, Sealed Power Corp., Muskegon, Mich.

Watson, Rudolph Burney, Jr. (J) special representative, Chrysler Corp., 420 Lexington Ave., New York (mail) 810 Second Ave., N., St. Petersburg, Fla.

Yates, Tom L. (M) sales engineer, Lord Mfg. Co., Erie, Pa.

### Foreign

Ralph, Clarence John (FM) managing director, L. M. Silver & Co., Ltd., Lucas House, Wakefield St., Wellington, C. 3, New Zealand.

## APPLICATIONS Received

The applications for membership received between Jan. 15, 1941, and Feb. 15, 1941, are listed below. The members of the Society are urged to send any pertinent information with regard to those listed which the Council should have for consideration prior to their election. It is requested that such communications from members be sent promptly.

### Baltimore Section

Wolf, Irvin Otto, lubrication engineer, American Oil Co., Baltimore.

### Canadian Section

Donaldson, George Ronald, assistant sales manager, B. F. Goodrich Rubber Co. of Canada, Ltd., Kitchener, Ont., Canada.

Lucas, John Allan, sales manager, tires, Dominion Rubber Co., Ltd., Kitchener, Ont., Canada.

McMahon, Harold H., project engineer, Allison Division, General Motors Corp., Indianapolis, Ind. Mail: 375 Wellington St., Ottawa, Ont., Canada.

### Chicago Section

Burgott, Arthur Glenn, student engineer, Bendix Products Division, Bendix Aviation Corp., South Bend, Ind.

Halvorsen, Harry, fleet supervisor, Curtiss Candy Co., Chicago.

McCann, Maurice E., engine draftsman, Electro-Motive Corp., LaGrange, Ill.

Randall, Clark C., automotive engineer, Sinclair Refining Co., Chicago.

### Cleveland Section

Beaton, Donald E., Thompson Products, Inc., Cleveland.

Brezina, Andrew Joseph, engineer, Thompson Products, Inc., Cleveland.

Getz, A. G., chief engineer, The Bishop & Babcock Mfg. Co., Cleveland.

Gilchrist, Albert D., assistant engineer, Leece-Neville Co., Cleveland.

Greenhill, F. Cyril, vice president and sales manager, The Acklin Stamping Co., Toledo, Ohio.

Hilf, Arthur G., diesel engineer, Hercules Motors Corp., Canton, Ohio.

Johnson, Paul P., engineer, Thompson Products, Inc., Cleveland.

Musser, Vernon E., power maintenance, Ohio Match Co., Wadsworth, Ohio.

Nagy, Henry Theodore, engineer, Thompson Products, Inc., Cleveland.

Oswald, R. Z., business manager, Thompson Products, Inc., Cleveland.

Selyem, Edwin J., charge of unit engineering, White Motor Co., Cleveland.

White, Vern S., engine designer, The White Motor Co., Cleveland.

### Dayton Section

Olson, Birger G., chief engineer, Hooven Owens & Rentschler Division, General Machinery Corp., Hamilton, Ohio.

O'Neil, Larry E., junior mechanical engineer, War Department Air Corps, Wright Field, Dayton, Ohio.

### Detroit Section

Doerr, Raymond S., engineer, draftsman, General Motors Corp., Detroit.

Dunn, George Edlin, chief engineer, Universal Products Co., Inc., Dearborn, Mich.

Keeler, Leonard B., manager, production planning, Wayne Division, Bendix Aviation Corp., Wayne, Mich.

Little, Joseph Prescott, vice president, General Motors Truck & Coach Division, Yellow Truck & Coach Mfg. Co., Pontiac, Mich.

Matheny, Harry R., operating manager, Chrysler Corp., Detroit.

McGrath, Edward J., sales representative, Risdon Mfg. Co., Detroit.

Nolan, Edmund T., purchasing agent, Advance Stamping Co., Detroit.

Reynolds, C. H., president, Sheffield Gage Corp., Detroit.

Shaw, Alexander J., service engineer, Carter Carburetor Corp., St. Louis, Mo. Mail: 2344 Pemberton Drive, Toledo, Ohio.

Starner, Ronald E., engineering, The Mather Spring Co., Toledo, Ohio.

### Indiana Section

Ansted, William B., Jr., president, Metal Auto Parts Co., Inc., Indianapolis.

Burleson, H. A., secretary, Mouldings, Inc., Indianapolis.

Drexler, Charles, proprietor, Charles Drexler Co., Indianapolis.

Graham, Arthur W., Jr., mechanical engineer, Noblitt-Sparks Industries, Inc., Columbus, Ind.

Hittle, Robert S., treasurer and general manager, Hittle Machine & Tool Co., Indianapolis.

Lituchy, Noel J., Allison Division, General Motors Corp., Indianapolis.

McDowall, C. J., engineer in charge of design, Allison Division, General Motors Corp., Indianapolis.

McKee, Murray P., engineer, Noblitt-Sparks Industries, Inc., Columbus, Ind.

Murphy, S. D., president, Mouldings, Inc., Indianapolis.

Myers, Clarence A., sales manager, Metal Auto Parts Co., Inc., Indianapolis.

Nieman, Ralph, tool engineer, Noblitt-Sparks Industries, Inc., Columbus, Ind.

Olender, Frank J., draftsman, International Harvester Co., Inc., Fort Wayne, Ind.

Osborn, Frank V., vice president and sales manager, Mouldings, Inc., Indianapolis.

Schuman, Chester Dean, engineer, Metal Auto Parts Co., Inc., Indianapolis.

Stewart, Douglas F., manager, Ideal Engineering Co., Indianapolis.

Westlund, A. F., vice president, Mouldings, Inc., Indianapolis.

### Metropolitan Section

Anderson, Guy B., design, checker, Breeze Corporations, Inc., Newark, N. J.

Beggs, Alan H., vice president and sales manager, The Palnut Co., Inc., Irvington, N. J.

Carroll, Richard T., president, C. E. L. Co., New York.

Dugan, Francis A., designer, Lawrance Engineering & Research Co., Linden, N. J.

Foell, Charles F., assistant editor, Diesel Publications, Inc., New York.

Foss, Joseph A., sales engineer, American Bosch Corp., New York.

Guerdan, George A., instructor, Department of Mechanical Engineering, College of the City of New York, New York.

Hampton, John Kenneth, sales, Theurer Wagon Works, Inc., North Bergen, N. J.

Lebow, Ralph H., test engineer, Lawrance Engineering & Research Co., Linden, N. J.

Miller, Richard B., experimental tester, Wright Aeronautical Corp., Paterson, N. J.

Roberts, Milton, sales engineering, Cummins Diesel Engine Corp. of New York, New York.

Sanford, Filbert C., sales engineer, Sun Mfg. Co., Chicago, Ill. Mail: 2707 Sedgwick Ave., Bronx, N. Y.

### Milwaukee Section

Grieve, Wayne B., chief experimental engineer, Le Roi Co., Milwaukee.

Herzberg, Anton A., general superintendent, Waukesha Motor Co., Waukesha, Wis.

Trautwein, Kendall E., sales engineer, S K F Industries, Inc., Milwaukee.

### New England Section

Fischer, Leander J., supercharger, research engineer, General Electric Co., Lynn, Mass.

Grantz, Howard E., engineer, General Electric Co., River Works, Lynn, Mass.

Macdonald, Donald S., traffic engineer, McCarthy Freight System, Inc., Taunton, Mass.

Williamson, Ralph G., automotive engineer, Socony-Vacuum Oil Co., Inc., Manchester, N. H.

### Northern California Section

Leveskis, Victor G., assistant engineer, U. S. Navy, Mare Island, Calif.

Murray, Carl Edward, dynamometer operator, Caterpillar Tractor Co., San Leandro, Calif.

Riechel, Walter H., equipment superintendent, State of California, Division of Highways, Stockton, Calif.

### Northwest Section

Lowe, A. K., tool planning engineer, Boeing Airplane Co., Seattle, Wash.

Monroe, R. J., president and manager, Inland Petroleum Transportation Co., Inc., Seattle, Wash.

### Philadelphia Section

Mines, Chester E., resident engineer, Jacobs Aircraft Engine Co., Pottstown, Pa.

Smith, John H., in charge of traffic and automotive maintenance, Esslinger's, Inc., Philadelphia.

### Pittsburgh Section

Evancho, Michael, automotive theory and mathematics instructor, Pittsburgh Board of Education, Connelley Vocational High School, Pittsburgh.

Werner, Norman H., Ed. Werner Transfer & Storage Co., Pittsburgh.

### Southern California Section

Billings, Samuel P., Jr., supervisor of equipment operations, Department of Water & Power, City of Los Angeles, Los Angeles.

Dantzer, Clarence L., designer, Douglas Aircraft Co., Inc., Santa Monica, Calif.

Fowler, Honor G., outside production inspector, Menasco Mfg. Co., Burbank, Calif.

Keesee, James H., ground school instructor, Ryan School of Aeronautics, Hemet, Calif.

Nurme, Eino Henry, designer, Douglas Aircraft Co., Inc., Santa Monica, Calif.

Schroeder, Albert M., lubrication engineer, Richfield Oil Corp., Los Angeles.

Shannon, Jack, shop contact engineer, Interstate Aircraft & Engineering Co., El Segundo, Calif.

Spowart, George, engineer, American Brakeblok Division, American Brake Shoe & Foundry Co., Detroit, Mich. Mail: 438 Chamber of Commerce Bldg., Los Angeles.

Sturgis, Winston O., draftsman, Douglas Aircraft Co., Inc., Santa Monica, Calif.

Thompson, Province H., power plant engineer, Douglas Aircraft Co., Inc., Santa Monica, Calif.

### Southern New England Section

du Pont, Stephen, head, experimental department, Indian Motorcycle Co., Springfield, Mass.

Prohaska, Bradley Jackson, engine tester, Pratt & Whitney Division, United Aircraft Corp., East Hartford, Conn.

### Washington Section

Brothers, James David, assistant to supervisor of automotive equipment, Virginia Electric & Power Co., Richmond, Va.

Brown, William Mulock, author of technical publications dealing with aero-engines, British Air Commission, Washington, D. C.

Ebaugh, Irvin Atwood, associate engineer (materials), U. S. Navy Department, Bureau of Ships, Washington, D. C.

### Outside of Section Territory

Boyer, Ralph L., chief engineer, Cooper-Bessemer Corp., Mt. Vernon, Ohio.

Campbell, Angus MacKinnon, vice president, M & C Aviation Co., Ltd., Prince Albert, Sask., Canada.

Eichorst, Herman H., service manager, Phoenix Motor Co., Phoenix, Ariz.

Irwin, Hubert, Sergeant, U. S. Army, Quartermaster Corps, Fort McPherson, Ga.

Mackay, William B. F., flying office, R.C.A.F., Aeronautical Engineering Branch, Rivers, Manitoba, Canada.

Manley, Frank Dewey, stress analyst, Stearman Aircraft Division, Boeing Airplane Co., Wichita, Kansas.

Robertson, Ernest B., Sergeant, U. S. Army, Quartermaster Corps, Fort McPherson, Ga.

Sanderson, Frank, Sergeant, U. S. Army, Quartermaster Corps, Fort McPherson, Ga.

Shirley, Wilson S., district manager, The Fafnir Bearing Co., New Britain, Conn. Mail: 2825 Commerce St., Dallas, Texas.

Tipton, Buldo E., Sergeant, U. S. Army, Quartermaster Corps, Fort McPherson, Ga.

## Sponsors Student Contest

Harry Trautman, chairman of the student activities committee for the Cleveland Section, has announced that the Section is again sponsoring a student papers contest, which is open to sophomores and juniors of Case School of Applied Science, Fenn College, and the cooperative students, located in Cleveland, of the General Motors Institute. The author of the best paper will receive a check for \$50, as well as a Junior Membership in the Society, and the second and third best papers will win for the authors Junior Memberships in the Society.

# About SAE Members

**WILLIAM A. WECKER** has been named president of McKinnon Industries Ltd., St. Catharines, Ont., succeeding **H. J. CARMICHAEL** whose appointment as assistant chairman of Canada's Wartime Requirements Board was announced in the February SAE Journal. Mr. Wecker, who was general manager of the company before his promotion, is St. Catharines regional vice chairman of the SAE Canadian Section. Mr. Carmichael was president of McKinnon Industries and vice president of General Motors of Canada, Ltd., before taking his wartime post.

**GEORGE C. RODGERS**, who since 1939 has been sales manager of the Curtiss Propeller Division, Curtiss-Wright Corp., Clifton, N. J., has been named management assistant of that unit. Mr. Rodgers joined the corporation's aircraft-engine manufacturing subsidiary, Wright Aeronautical Corp., in 1934, as a test engineer and field engineer, and later was assigned to the Washington, D. C., office of the parent organization.

**RALPH E. FLANDERS**, president of the Jones & Lamson Machine Co., Springfield, Vt., has been appointed group administrator of the tools and equipment section of the Division of Priorities, Office of Production Management, **E. R. STETTINIUS, JR.**, director of priorities for the OPM announced Feb. 6.

**WILLIAM L. BATT**, SKF President, is deputy director of the new Production division of the Office of Production Management. **EMORY S. LAND** is chief of ships in the Ship, Construction and Supplies Division of the OPM.

**HERBERT LEE** has resigned as technical manager, Harold Andrews Grinding Co., Ltd. of Birmingham, England, to take the position of director in the firm of A. C. Whitehorn, Ltd. in Bristol, England. The company with which Mr. Lee is now associated is engaged in automotive and marine engineering.



**Herbert Lee**  
Becomes  
Director

**LEO M. EDWARDS** is associated with the Navy Department in New York as chief engineering aide in the machinery allowance section. Formerly he was foreman and test engineer with the Quaker State Oil Refining Corp., Emlenton, Pa.

**COL. EDWIN E. ALDRIN** will be manager of the Newark Airport when that large field is re-opened for commercial airline service in the near future. Accepting his new post, Col. Aldrin, who is an Army Air Corps reserve officer and former air squadron commander of the U. S. Army in the Philippines,



**Col. Edwin E. Aldrin**  
Manages Airport

was promised by Newark Mayor M. C. Ellenstein "full authority for direction and operation of all airport activities without the slightest political intervention." Col. Aldrin says that the Army Air Corps will not at present consider Newark as a base because of the instability of the policy and control over the airport but believes that there will be reconsideration "as soon as the situation is cleared up."

**R. H. FLEET**, president of Consolidated Aircraft Corp., and **CARL SQUIER**, vice president of Lockheed Aircraft Corp., have been added to the board of directors of Bowlus Sailplane Co., San Fernando, Calif.

**THOMAS A. WATSON** heads a faculty of specialists from the airplane industry which will train men for national defense work at the University of California at Los Angeles. Mr. Watson is associate in mechanical arts at U.C.L.A. and is an outstanding authority on tooling for production. The course will be offered free of charge to employees chosen from the aircraft industries.

**LT.-COL. M. V. BRUNSON**, Quartermaster Corps, whose last assignment in the War Department has been as liaison officer with the SAE-QMAC Advisory Committee, has been transferred for station and duty with the Headquarters of the Armored Force at Fort Knox, Ky. Col. Brunson will retain his membership in the Transportation and Maintenance Activity Committee of the Society.

**WILLIAM EDWARD JAMISON**, who has been an instructor in aeronautic shop work at the Provincial Institute of Technology and Art at Calgary, Canada, has joined the engineering branch of the Royal Canadian Flying Corps and is a flying officer. He is located at the R.A.C.F. Engineering School in Montreal.

**E. S. CHAPMAN**, Plymouth vice president and 1941 SAE vice president representing the Production Activity, began new duties in Washington with the Office of Production Management late in January. Mr. Chapman is on leave from Plymouth.

**LT.-COL. HARRY A. KNOX**, a founder member of the SAE upon whom life membership was conferred recently, and who is chief automotive engineer of the Ordnance Department of the U. S. Army, now has his headquarters in the New Social Security Building, Washington, D. C.

**A. M. HAZELL, SR.**, early last month was advanced from his post as assistant general supervisor to that of manager and general supervisor of the automotive division of The Cudahy Packing Co., Chicago.

**JAMES G. HAYDEN**, formerly fleet engineer, National Safety Council, has joined Horton Motor Lines, Inc., Charlotte, N. C., as fleet engineer. He also will assist the company's director of safety and personnel. Prior to his affiliation with the National Safety Council, Mr. Hayden was traffic engineering field supervisor for the Michigan Highway Planning Survey.

**CHARLES EDWARD BATSTONE**, formerly sales specialist on heavy-duty trucks with International Harvester Co. in Boston, is now with Brockway Motor Co., Inc., at Brighton, Mass., as sales engineer.

**H. V. FLEMING**, Timken Roller Bearing Co., was transferred, as of Feb. 1, to Timken's Birmingham, Ala., office as district manager of industrial bearings and steel sales. Prior to this change, Mr. Fleming was on the Timken engineering sales staff in Chicago.

**CAPT. S. VANCE KRAUTHOFF** has been named maintenance officer of the 27th Field Artillery Battalion, U. S. Army, at Fort Knox, Ky.



**John W. Rix**  
Joins  
Cessna

**JOHN W. RIX** has left the Waco Aircraft Co. to become production engineer for the Cessna Aircraft Co. of Wichita, Kansas.

**C. C. CARLETON**, managing director of the Automotive Committee for Air Defense, says that 107,250 men will be required to achieve the program of parts and assembly production for bombers which the automobile industry has undertaken. Should the daily production of parts be doubled, as it may well be by the time assembly actually begins, he says, it will require employment of 214,500 men and double the daily quota 137,500 lb of aluminum and 42,200 lb of steel needed for execution of the existing program.



**FREDERICK C. BRANDT** is now engaged in chassis design work at American Bantam Car Co. in connection with reconnaissance cars for the U. S. Army. He was formerly chassis layout engineer at General Motors Truck & Coach, Division of Yellow Truck & Coach Mfg. Co.

**VICTOR WILLIAM ALDEN** recently resigned from United Air Lines Transport Corp., Chicago, to accept his present post as ground inspector for the Civilian Pilot Training Service, Civil Aeronautics Administration, at the Peoria Municipal Airport, Peoria, Ill.

**E. S. EVANS**, since Jan. 27, has been head sales engineer of the Standard Oil Co. of Calif., Los Angeles. He formerly was sales engineer.

**DR. GUSTAV EGLOFF**, director of research, Universal Oil Products Co., has been



**Gustav Egloff**  
Gets  
Chanute  
Medal

presented the Octave Chanute Medal, awarded annually for the best paper on mechanical engineering read before the Western Society of Engineers.

**GORDAN J. CUSHMAN** recently joined the personnel staff of Stinson Aircraft, Division of Vultee Aircraft, Inc., Wayne, Mich. He formerly was cost accountant with the U. S. Spring & Bumper Co., Los Angeles.

**LT. F. E. BLACK**, formerly engineering assistant, Gulf Research & Development Co., Pittsburgh, writes that he is with the 71st Coast Artillery, Fort Story, Va., as motor transport officer.

**JACK L. H. EVERITT**, who had been with the National Steel Car Corp. of Malton, Canada, for some time, recently became tool designer for Research Enterprises, Ltd., at Leaside, Canada. He will be engaged in work on optical and radio equipment.

**JAN A. TUSZYNSKI** has left Rumania and has taken up new work in Turkey with the Turkish Aeronautical League (Türk Hava Kurumu).

**BELMONT F. BEVERLY** has become a fleet salesman for Socony-Vacuum Oil Co. in Poughkeepsie. He had formerly been located in Albany with the same company.

**J. P. BENJAMIN** is now design engineer with the St. Louis Airplane Division of Curtiss-Wright Corp., where he has been a member of the engineering department for some time.

**JAMES WARDEN**, formerly a member of the SAE Student Branch at the Massachusetts Institute of Technology, is now with the Little Air Products Co., Tonawanda, N. Y.

**D. A. WALLACE**, president, Chrysler Division, Chrysler Corp., has been appointed by the American Society of Tool Engineers to represent that organization on a committee dealing with the classification and designation of surface qualities working under the procedure of the American Standards Association.

**WILLIAM H. SMYTHE, JR.** has transferred his activities from the engineering to the sales division of the Acme Steel Co. He is now located in the Book Building in Detroit.

**GEORGE C. DAVIES**, still with the Socony-Vacuum Oil Co., is now located in St. Louis. He was for some time manager of the company's Rockefeller Center Exhibit in New York.

**ARTHUR JAMES HARFORD** has been named managing director of the G.U.D. Manufacturing Co., Melbourne, Australia. His company is engaged in production of chemicals for aeronautical and automobile use.

**GUY E. FINOUT** has been drafted for U. S. Army service and began his year of military training about the middle of January. He had been a student at General Motors Institute of Technology and an employee of the Fisher Body Division of General Motors at Flint.

**HERB PACKER**, editor, *Motor Service Magazine*, is stressing in his publication educational material which will show automobile mechanics the difference between service work on automobile engines and aviation engines.

## Defense Quotes . . . .

"If America has faith and is willing to have a little sweat for a year or so, then we might save a little blood later on."—*William S. Knudsen, director general of the Office of Production Management.*

"In our democracy it is not possible to build a strong economy in war or peace except as it is built of the people, by the people, and for the people with an understanding of what it means and how it works."—*Alfred P. Sloan, Jr., chairman, General Motors Corp.*

"Reports from abroad indicate that the only real secret weapon of the aggressor nations is hard work and lots of it—and that weapon is no secret to the American people."—*John W. Thomas, president, Firestone Tire & Rubber Co.*

"During the last year, American manufacturers have delivered to the Government, in tens of thousands, the most efficient trucks, automobiles, and other types of motor vehicles that have been produced anywhere. In the months ahead, as the armed forces are expanded, more than 200,000 additional vehicles will roll off the assembly lines to equip them."—*Pyke Johnson, executive vice president, Automobile Manufacturers Association.*

**OSCAR A. AXELSON** is on leave of absence from his post as automotive engineer, Columbia Engineering Corp., New York, to serve as lieutenant colonel of the 187th Field Artillery, Fort Ethan Allen, Vt. Col. Axelsson attended the United States Military Academy at West Point from June 1915 to



**Oscar A. Axelsson**  
Lieutenant  
Colonel

June 1918, and served as first lieutenant with the Coast Artillery Corps, Field Artillery, and U. S. Corps of Engineers, respectively, between 1918 and 1926. For the next two years he was instructor of mathematics at the U. S. Military Academy. After leaving the Army, he was with the National City Co., New York, prior to joining the Columbia Engineering Corp. in 1931.

**F. W. ANDREW** is now with the American Oerlikon Gazda Corp. in Providence, R. I. He is production engineer.

"Let's Live for America," an address by **PAUL G. HOFFMAN**, president of Studebaker, before the 21st annual convention of American Trade Association Executives at Chicago last fall, has been read into the Congressional Record by Hon. Edward R. Burke, Senator from Nebraska.

**CLAYTON FARRIS**, president, Trucktor Corp. of Newark, has been elected president of the National Motor Truck Show, Inc., for 1941. Mr. Farris succeeds **J. F. WINCHESTER**, who served as president of the corporation for the past seven years. SAE members elected as vice presidents of the corporation for the term of one year were: **JOHN F. CREAMER**, president, Wheels, Inc., and **ELBERT E. HUSTED**, vice president, Titeflex Metal Hose Co.

Actively participating in the program of the American Road Builders Association at its 38th Annual Convention in New York last January were SAE members, **DR. MILLER MCCLINTOCK**, **PYKE JOHNSON**, **L. G. KURTZ**, **DR. H. C. DICKINSON**, **MAXWELL HALSEY**, and **WILLIAM B. STOUT**.

**CLIFTON GASAWAY**, formerly a student at Tri-State College of Engineering, is now employed by the Ex-Cell-O Corp., Detroit.

**LT. PAUL M. IRWIN**, formerly tire sales manager of the Dominion Rubber Co. Ltd., is serving somewhere in Britain with the Canadian Active Service Force.

**L. D. HAGENBOOK**, Goodman Mfg. Co., was promoted to assistant chief of this company, last Fall. He formerly worked for Northwest Engineering Co., Green Bay, Wis., as gas engine designer; and earlier at Ross Gear & Tool Co., Lafayette, Ind.

**KENDALL PERKINS**, formerly research engineer with American Airlines, Inc., New York Municipal Airport, since Feb. 1, has been chief, airplane program, aeronautical division, Office of Production Management, Washington, D. C.

## Committee Personnel Is Revised; New Appointments

Committee activity throughout the SAE has been moving forward at an accelerated pace in recent months. Work in many groups has expanded in scope as well as in intensity. Part of this movement is reflected in changes made in the personnel of various groups, in the adding of names in other cases, and in new appointments to new committees in still others. Recent SAE committee personnel news includes the following:

**COL. GEORGE GREEN** has been named vice chairman of the currently very active Ordnance Advisory Committee. Chairman **COL. H. W. ALDEN** appointed Col. Green to fill the place made vacant by the recent death of Past President **W. GUY WALL**.

**P. B. TAYLOR** has been appointed to serve for three years on the Manly Memorial Medal Board of Award; **PETER ALTMAN** to serve for three years on the Wright Brothers Medal Board of Award; and **JOHN M. CAMPBELL** to serve for three years on the Harry L. Horning Memorial Award Committee.

**AUSTIN M. WOLF** and **R. R. TEETOR** have been named for three year terms on the Clarkson Memorial Committee, with **J. A. ANGLADA**, whose term has two years still to run, continuing as chairman of this committee.

Changes recently made in Standards Committee personnel: **W. S. COCHRANE** becomes chairman of the Diesel Engine division; **ADOLF GELPKE** has been named chairman and **L. R. BUCKENDALE** vice chairman of the Motorcoach and Motor Truck Division, while **W. P. MITCHELL** becomes a member of this division; **A. W. FREHSE** takes a place on the Parts and Fittings Division; and **A. E. LEACH** on the Passenger Car Division.

A new subcommittee of the Motor Truck Rating Committee commissioned by the SAE Council to review the SAE Size and Weight Code to determine the desirability of revision has been appointed as follows: **F. K. GLYNN**, chairman, **E. W. ALLEN**, **L. R. BUCKENDALE**, **F. L. FAULKNER**, **M. C. HORINE**, **T. L. PREBLE**, **S. B. SHAW**, **JOHN L. S. SNEAD, JR.** and **J. F. WINCHESTER**.

**DAVID BEECROFT**, SAE Treasurer, has been re-appointed as the SAE representative on the Convention Advisory Committee of the Greater New York Safety Council.

**I. M. LADDON**, Consolidated Aircraft Corp., has been relieved as chief engineer to devote his efforts to the introduction of improved production methods.

**W. E. GREENE** has left Lockheed Aircraft Corp. to become sales engineer for the Morrow Aircraft Corp.

**ALFRED ROMAN** is now associated with Electrol, Inc. as a designer. He is located in New York.

**HENRY D. HUKILL**, sales engineer, Bendix Products Division, South Bend, Ind.,



Henry D. Hukill  
Assistant  
Sales  
Manager

has recently been appointed assistant sales manager, Bendix Products Division, in charge of B-K vacuum power brake activities.

**NICHOLAS POST** has been working as an ordnance inspector for the St. Louis Ordnance District of the War Department for the last six months. He was associated previously with the Key Co. of East St. Louis.

**JOHN C. SQUIERS** has joined the airplane parts division of Briggs Mfg. Co. as project engineer. He went to Detroit early in January. Mr. Squiers was formerly an airplane designer for Glenn L. Martin Co.

**EARLE G. FAHRNEY**, formerly at the General Motors Proving Ground, was transferred to product study work at the Detroit transmission division of the corporation a few months ago.

**LOUIS STEVENS** is draftsman with the Willamette Iron & Steel Corp., Portland, Ore. He formerly was inspector of equipment, U. S. Department of the Interior, Fish & Wildlife Service, with headquarters in Portland.

**DR. MILLER MCCLINTOCK**, director of the Bureau for Street Traffic Research, Yale University, recently told 83 Texas newspaper men at a traffic seminar conducted by Commercial Investment Trust at Austin, Texas, that "despite tremendous improvements, every city and town in the United States and the country as a whole suffer from street and highway systems entirely inadequate to meet the requirements of modern traffic."

## New General Motors Assignments

**A. J. SCHAMEHORN** is now actively engaged in his new duties as assistant general manager of the Linden Division of General Motors Corp. This important manufacturing assignment came to him after 11 years as director of the General Motors Proving Ground. During that period he was called temporarily to several important exhibit tasks, the most recent being that of managing the huge General Motors building at the New York World's Fair. Mr. Schamehorn first entered General Motors in 1922 by way of General Motors Truck Co. at Pontiac, an organization of which he became service manager. He joined the SAE in 1930 and recently has been active in committee work of great importance to the industry and the Society.



Ernest Emerson Wilson



A. J. Schamehorn

**ERNEST EMERSON WILSON** succeeds Mr. Schamehorn as director of General Motors Proving Ground. Mr. Wilson came to General Motors from the National Advisory Bureau for Aeronautics about 12 years ago and served first as an engineer in the Research Department at Detroit. He went to the Proving Ground in 1928 as director of the Acoustical Laboratory and was named assistant director of the Proving Ground in 1939. Mr. Wilson has been a member of the SAE since 1937.

**RUDOLPH F. GAGG**, SAE Metropolitan Section chairman, has been made assistant to the general manager at Wright Aeronautical Corp. to work on special projects. Long associated with Wright, Mr. Gagg was formerly assistant chief engineer and re-



**Rudolph F. Gagg**  
On  
Special  
Projects

cently had been loaned to the Government to direct the construction of its Aeronautical Engine Laboratory at Cleveland.

Scheduled for active participation in the National Forum of the American Transit Association, Bus Division, on bus fuels and lubricants at Detroit, Feb. 17-18, were more than a dozen active SAE members including **E. S. PARDOE**, Capital Transit Co.; **CHARLES O. GUERNSEY**, J. G. Brill Co.; **A. J. BLACKWOOD**, Standard Oil Development Co.; **H. I. SULLIVAN**, Eastern Massachusetts Street Railway Co.; **R. H. STIER**, Philadelphia Transportation Co.; **ROBERT CASS**, White Motor Co.; **WILLIAM B. STOUT** (who spoke at the dinner); **H. C. MOUGEY**, General Motors Corp.; **J. C. BAINE**, New Orleans Public Service, Inc.; **W. F. AUG**, Mack Mfg. Corp.; **GEORGE ROUND**, Socony-Vacuum Oil Co., Inc.; **DR. RAYMOND HASKELL**, The Texas Co.; and **G. K. SQUIER**, Standard Oil Co. of Indiana.

**WILLIAM C. GOULD** has become assistant to the president of Brewster Export Corp. in New York, having left his position as sales engineer, Wright Aeronautical Corp.

**JOSEPH S. PATRONI** is now an instructor on airplane engines at the ground school division of the U. S. Naval Air Station at Jacksonville, Fla.

**JUSTIN R. WHITING** recently assumed new duties as industrial engineer with Murray Corp. of America.

SAE members played a prominent part in the Jan. 23 ground-breaking ceremonies for the large engine research laboratory of the National Advisory Committee for Aeronautics to be erected on the border of the Cleveland Municipal Airport. **FRED C. CRAWFORD**, Cleveland Chamber of Commerce President, was among the notables in whose presence the ground breaking took place; **DR. GEORGE W. LEWIS**, NACA director of aeronautical research and SAE Vice President, swung the chromium plated pick which actually broke the ground; and SAE Past-President **EDWARD P. WARNER** headed a special subcommittee representing the NACA at the exercises.

**L. C. WELCH**, Standard Oil Co. of Indiana, is chairman of the Lubrication Committee of the American Petroleum Institute for 1941.

Present when the 25,000th Pratt & Whitney aircraft engine rolled off the assembly line on Jan. 23rd were SAE members **E. E. WILSON**, president, United Aircraft Corp.; **A. V. D. WILLGOOS**, chief engineer, Pratt & Whitney Division; and **W. A. PARKINS**, assistant chief engineer Pratt & Whitney Division.

**WILLIAM E. SCHAEFER** is now general superintendent in charge of manufacturing operations for Republic Aviation Corp.

**PAUL B. HOFFMAN** has been made general sales manager of American Brakeblok Co. of Detroit.

**CLARENCE E. MOORE**, formerly with the U. S. Department of the Interior, opened his own business early in January as a Studebaker dealer in Cleveland. His new organization is named Moore Motors, Inc.

**JAY D. JOHNSON**, formerly design engineer with the John Deere Tractor Co., Waterloo, Iowa, has joined the engineering department of the Caterpillar Tractor Co., Peoria, Ill.

**G. L. HARTMAN** has joined the White Motor Co., Cleveland, as assistant engineer, bus division. He previously was assistant engineer with the Superior Coach Co., Lima, Ohio.

**WILLIAM NEMOY**, formerly production planning supervisor at American Screw Products in Los Angeles, is now experimental tool planner for Lockheed Aircraft Corp. at Burbank.

### Thomas Alexander Russell

Thomas Alexander Russell, who was prominently associated with the Canadian automotive industry throughout his business career and who had been a member of the Society for 29 years, died at his home in Toronto, Dec. 29. At the time of his death, he was president of Massey-Harris Co., Ltd., Canadian Acme Screw & Gear Ltd., Russell Industries Ltd., Canada Cycle & Motor Co., Galt Machine Screw Ltd., and was actively engaged in the administration of many other Canadian industries. From 1916 until 1933 he was associated with Willys-Overland Ltd., first as vice president and as president after 1918.

Mr. Russell, who was 63 years old, was born in the province of Ontario. He obtained his technical education at the University of Toronto, graduating in 1899. In 1911, when he became a member of the Society, he was 1st vice president and general manager of the Russell Motor Car Co. Ltd.

### Fred R. Nohavec

Fred R. Nohavec, for some years in charge of engineering for the Donaldson Co., Inc., St. Paul, Minn., died suddenly Dec. 19 following a heart attack. At that time he was carrying on research work at the laboratory of the American Air Filter Co., Louisville, Ky.

**JACK JEROME**, formerly project engineer of Air Associates, Inc., has joined the aircraft division of Electrol, Inc. as design engineer. His address is Apollo Magneto Corp., Kingston, N. Y.

**KENNETH I. ROBINSON** has joined the International Harvester Co. at Fort Wayne, Ind., as a dynamometer operator. He was at one time associated with the Sterling Motor Truck Co. of Milwaukee.

**RAYMOND R. SNYDER** has been made quality manager of the Indianapolis plant of the propeller division of Curtiss-Wright Corp.

**EDWIN H. OLMSTEAD**, formerly mechanical engineer, Well Surveys, Inc., Tulsa, Okla., has joined the Lawrance Engineering & Research Corp., Linden, N. J., as experimental test engineer.

**E. H. HUFF** has moved his activities from Nashville, Tenn., to Wayne, Mich. He was



**E. H. Huff**  
Chief  
Inspector

factory superintendent for the Stinson Division, Vultee Aircraft, Inc., at Nashville; now he is chief inspector for the same organization at Wayne.

Mr. Nohavec received his B. Sc. Degree in Agricultural Engineering from the University of Nebraska in 1918. The following year he returned to University's Tractor Testing Department as engineer in charge of tests. He held that post until 1925 when he became service manager for the John Deere Tractor Co. at Omaha, Neb. After a short time, he left there to help the United States Department of Agriculture organize a service department on the corn borer program. Mr. Nohavec then joined the Vortex Mfg. Co., Claremont, Calif., in charge of sales and engineering of air cleaners. He continued his work on air cleaners and related products when he joined the Donaldson Co., Inc., as engineer in 1933, and delivered a paper on the topic before the Society in 1934.

Mr. Nohavec was 49 years old and had been a member of the Society since 1935.

### William Dudley Croft, Jr.

William Dudley Croft, Jr., who received his M. E. Degree with the Class of '40 at Purdue University, was killed in an accident while doing night flying at Randolph Field, Texas, as a part of his training as an Army pilot. He was to have gone to Kelley Field for advanced training later that month.

Mr. Croft became a member of the SAE Student Branch at Purdue in 1939. He was born in Beclerton, Ky., in 1919.



Officers and department heads of the Vanadium Corp. of America gathered Jan. 10 to celebrate **GEORGE L. NORRIS's** 75th birthday (Jan. 11) and the 32nd anniversary of his association with the company and its predecessor. Mr. Norris is chief metallurgical engineer of the company. He has been a member of the SAE since 1910.

**COL. O. B. ZIMMERMAN**, consulting engineer, has been in U. S. Veterans' Hospital since Sept. 4, 1940. He is suffering from a heart and anemic condition but is doing well and is greatly improved. Visiting days are Tuesday, Thursday and Sunday, 2:30 to 4:30 p.m.

**ORIN L. ROMIGH** has been with the Remington Arms Co. in Bridgeport since the first of the year. He was formerly foundry foreman with the National Meter Co. in Brooklyn.

**FREDERICK O. LEIDEL**, formerly a member of the SAE Student Branch at the University of Wisconsin, is student engineer with Hamilton Standard Propellers, Division of United Aircraft Corp., East Hartford, Conn.

**EDWARD H. WARNER** is junior mechanical engineer in the Air Corps Materiel Division at Wright Field, Dayton. He was a student at Cooper Union Institute of Technology, New York.

**NIKOLA TRBOJEVICH** is now associated with the Spicer Mfg. Corp. at Toledo. He is engaged in consulting and research engineering activity.

## About Authors

(Concluded from page 13)

■ **NATHAN C. PRICE** in 1928 started a series of intensive design studies of aircraft powerplants and powerplant equipment, and has been carrying on this work up to the present time. He has designed and supervised the construction of several experimental powerplants for aircraft, including gasoline and diesel internal-combustion engines, vapor powerplants, and binary-cycle powerplants. He was formerly in charge of design and development of mechanical equipment at Boeing Aircraft Co., and since the latter part of 1940 has been engaged in advanced mechanical equipment design for Lockheed Aircraft Corp. Mr. Price attended Princeton University for two years as a War Memorial Scholarship holder, and is a graduate of the University of California.

■ **KENNETH A. STONEX** was employed as instrument man, special survey department, at the General Motors Proving Ground for several years be-

fore he entered Michigan State College from which he received his B.S. in Mathematics in 1933. He received his M.A. in Mathematics from the University of Michigan in the following year, and soon after returned to the Proving Ground. He was assigned to the Technical Data Section, and became assistant head in 1938, and assistant mechanical engineer in June of last year. "In the last six years," he writes, "I have witnessed and participated in the development of car control tests and have first-hand experience in the art from its infancy."

■ **CARL E. SWANSON'S** (M '40) major field is communications engineering. After graduating with his B.S. Degree in E.E. from the University of Minnesota in 1927, he spent the next two years with Westinghouse Electric & Mfg. Co. as a radio engineer on design of high-powered transmitters. Then followed 10 years on the faculty of his Alma Mater, first as a member of the department of electrical engineering and then from 1931 to 1939, as a member of the mathematics and mechanics department. While there he devoted several years to research in the field of electro-acoustics, and obtained his degree of M.S. in E.E. and the professional degree of Electrical Engineer. Since 1939 he has been electrical engineer with Northwest Airlines.

# SAE Certificates of Net Horsepower

## (For Use in Rating Potential Performance of Motor Trucks)

**WHEN** the report of the SAE Motor Truck Rating Committee on ability ratings was published in the January, 1940, issue of the SAE Journal, pages 11-15, the two certification forms presented on these pages were not complete.

It will be recalled that the report provides a concise definition of maximum net brake horsepower and specifies in considerable detail what information should be given in support of the horsepower certified.

\* The accompanying forms—one for gasoline engines and the other for diesels—provide a method for the presentation of the information specified.

The faces of the two forms are similar except that one carries gasoline engines in parentheses under the heading while the other carries diesel engines. The reverse sides of the form follow the same general pattern but the supporting data required differ in a number of details because of the differences between the two types of engines.

### CERTIFICATE OF MAXIMUM NET HORSEPOWER

(Gasoline Engines\*)

This is to certify that the { truck identified as follows:  
truck-tractor

MAKE .....  
MODEL .....  
ENGINE MAKE .....  
ENGINE MODEL .....

in proper operating condition and adjustment, has a maximum net brake horsepower not less than ..... at ..... R.P.M., after deducting power losses due to exhaust system, fan and other power absorbing accessories and attachments checked on supporting data sheet on the back of this certificate.

(Signed) .....  
(Title) .....  
(Firm) .....

Sworn to and subscribed before me this ..... day of ....., 19....  
L.S. ....

Notary Public (County) (State)  
My Commission expires .....

# PERFORMANCE DATA REQUIRED ON REVERSE SIDES OF CERTIFICATES

## Gasoline Engines

## Diesel Engines

Horsepower

### GROSS HORSEPOWER CURVE\*

NET HORSEPOWER CURVE\* (Indicate horsepower certified)

(This area to be ruled for plotting curves)  
(Approximate Size: 6 in. wide x 4 in. high)

Engine R.P.M.

*Gross horsepower* is the brake horsepower determined under conditions as defined hereinafter by dynamometer test of the stripped engine—that is the brake horsepower of the engine with only those accessories and attachments necessary to the functioning of the engine during this test.

*Net horsepower* is the brake horsepower delivered to the clutch, or its equivalent with all accessories and attachments functioning (including exhaust pipe, muffler, and trail pipe) which are standard or regular equipment on the engine as installed in the particular chassis model. The manufacturer may determine the net horsepower by subtracting accessory power consumption from the gross brake horsepower or by direct test with accessories installed and functioning.

Horsepower shall be determined under conditions and in accordance with procedure prescribed by current SAE Recommended Practice for the type of engine under test, as established by the SAE Standards Committee.

### DESCRIPTION OF ENGINE AND EQUIPMENT

- |                                  |                                 |
|----------------------------------|---------------------------------|
| 1. Engine Make .....             | *8. Inlet Valve Lift .....      |
| 2. Engine Model .....            | *9. Exhaust Valve Clear Diam.   |
| 3. No. of Cylinders .....        | *10. Exhaust Valve Lift .....   |
| 4. Bore .....                    | *11. Inlet Valve Opens .....    |
| 5. Stroke .....                  | *12. Inlet Valve Closes .....   |
| 6. Piston Displacement .....     | *13. Exhaust Valve Opens .....  |
| 7. Compression Ratio .....       | *14. Exhaust Valve Closes ..... |
| *15. Maximum Spark Advance ..... | Deg.                            |
| Retard .....                     | Deg.                            |

\*If not poppet type, explain below:

### POWER ABSORBING ACCESSORIES, EQUIPMENT AND ATTACHMENTS

{ In column A check items which were functioning when gross horsepower was determined. In column B check all additional items which were functioning when net horsepower was determined. List and check any additional items. Items not used, write "None." }

- |                            | A | B |
|----------------------------|---|---|
| *1. Oil Pump .....         |   |   |
| *2. Water Pump .....       |   |   |
| *3. Fan .....              |   |   |
| *4. Exhaust Pipe .....     |   |   |
| *5. Muffler .....          |   |   |
| 6. Trail Pipe .....        |   |   |
| 7. Fuel Pump .....         |   |   |
| †8. Ign. Distributor ..... |   |   |
| †9. Magneto .....          |   |   |
| 10. Air Filter .....       |   |   |
| 11. Governor .....         |   |   |
| 12. Generator .....        |   |   |
| 13. Vacuum Pump .....      |   |   |
| 14. Compressor .....       |   |   |
| 15. ....                   |   |   |

\* Required. † Either or both. ° Required if water-cooled.  
Fuel used in brake horsepower tests to have octane rating equivalent to that of currently available, "regular price" gasolines.

Corrected horsepower

### GROSS HORSEPOWER CURVE\*

NET HORSEPOWER CURVE\* (Indicate horsepower certified)

(This area to be ruled for plotting curves)  
(Approximate Size: 6 in. wide x 4 in. high)

Engine R.P.M.

*Gross horsepower* is the brake horsepower determined under conditions as defined hereinafter by dynamometer test of the stripped engine—that is the brake horsepower of the engine with only those accessories and attachments necessary to the functioning of the engine during this test.

*Net horsepower* is the brake horsepower delivered to the clutch, or its equivalent, with all accessories and attachments functioning (including exhaust pipe, muffler, and trail pipe) which are standard or regular equipment on the engine as installed in the particular chassis model. The manufacturer may determine the net horsepower by subtracting accessory power consumption from the gross brake horsepower or by direct test with accessories installed and functioning.

*Corrected horsepower* shall be determined under conditions and in accordance with procedure prescribed by current SAE Standard for the type of engine under test, as established by the SAE Standards Committee.

### DESCRIPTION OF ENGINE AND EQUIPMENT

- |                              |        |
|------------------------------|--------|
| 1. Engine Make .....         |        |
| 2. Engine Model .....        |        |
| 3. Cycle-Stroke .....        |        |
| 4. No. of Cylinders .....    |        |
| 5. Bore .....                | Stroke |
| 6. Piston Displacement ..... |        |
| 7. Compression Ratio .....   |        |

### POWER ABSORBING ACCESSORIES, EQUIPMENT AND ATTACHMENTS

{ In column A check items which were functioning when gross horsepower was determined. In column B check all additional items which were functioning when net horsepower was determined. List and check any additional items. Items not used, write "None." }

- |                                    | A | B |
|------------------------------------|---|---|
| *1. Lubrication Oil Pump .....     |   |   |
| 2. Fuel Transfer Pump .....        |   |   |
| *3. Fuel Injection Equipment ..... |   |   |
| *4. Water Pump .....               |   |   |
| *5. Fan .....                      |   |   |
| *6. Exhaust Pipe .....             |   |   |
| *7. Muffler .....                  |   |   |
| 8. Trail Pipe .....                |   |   |
| 9. Air Cleaner .....               |   |   |
| *10. Governor .....                |   |   |
| 11. Generator .....                |   |   |
| 12. Vacuum Pump .....              |   |   |
| 13. Compressor .....               |   |   |
| 14. ....                           |   |   |
| 15. ....                           |   |   |
| 16. ....                           |   |   |

\* Required  
° Required if water-cooled  
Fuel used in brake horsepower tests to have 40 to 60 cetane rating.

# NEWS OF SOCIETY

(Continued from page 18)

ports the assignment of SAE men to national defense posts and the entry of others into military service. From abroad has come news from foreign members named to new posts due to war conditions.

Besides listing the names, company connections, and membership status of all SAE members, the Roster lists national officers of the Society, Section and Student Branch officers, personnel of committees, past presidents, and life members. It also carries information on SAE membership, publications, and other pertinent data.

## Need for Heavy-Duty Oil Laid to Public's Demands

■ Pittsburgh

The public's demand for maximum performance with minimum operating expense, both for pleasure and commercial vehicles, is the primary cause of the present need for new types of heavy-duty lubricants, C. W. Georgi, technical director of Quaker State Oil Refining Corp., told an overflow crowd at the Pittsburgh Section's Jan. 28 meeting.

To meet these demands, he said, automotive engineers, during the past ten years have almost doubled the horsepower output of the average engine, with little or no increase in engine size. Oil consumption has been decreased. Diesel engines have been adopted to provide greater economy in commercial transportation. Improved highways permit higher speeds for longer periods. All of these factors, Mr. Georgi explained, combine to subject the oil in the engines to higher temperatures.

While we put only oil into the crankcase, he continued, a lot of other things find their way in, including water, dirt, lead compounds, fuel residues and, last but not least, large quantities of air.

With its rapidly moving parts in the presence of high temperature and air, any automobile engine becomes a very efficient apparatus to oxidize oil, Mr. Georgi pointed out. The rate of oxidation of oil approximately doubles for each 20 F rise in temperature (between 280 F and 400 F), he said. The fact that modern engines expose the oil to higher temperatures, coupled with the fact that only a small temperature increase can cause a rapid increase in the rate of oil oxidation, he stated, makes the matter of oil stability highly important. This, he said, has brought about a definite need for oils treated with oxidation and corrosion inhibitors, as well as with detergent type additives, for many types of heavy-duty commercial service.

Lead compounds from gasoline, Mr. Georgi explained, are most apt to accumulate in the crankcase oil when engines are used in light service involving frequent stops and starts and idling, particularly in cold weather. Under these conditions, he said, the relatively cold cylinder walls cause condensation of fuel and fuel residues which result in accumulation of lead compounds in the crankcase oil. He pointed out that these compounds may deposit out on non-moving engine surfaces or accumulate on oil screens, oil filters, and the like, creating the impression that the oil has sludged, whereas the oil may be in good condition. Lead ac-

cumulations in the crankcase oil have not been found to be harmful, provided they are not allowed to reach excessive concentrations, he commented.

Winter sludge is another condition, mentioned by Mr. Georgi, which is encountered in light-duty service, wherein not only lead compounds and other fuel residues find their way into crankcase oil, but also water. In such cases, he said, emulsion sludges, consisting of oil, water and other contaminants, may be formed. Here again, when such emulsion sludges are found, the oil is apt to be blamed rather than the contaminants which find their way into the oil, he concluded.

In discussion, C. J. Livingstone of Mellon Institute, and Mr. Georgi, covered the relation between copper-lead and cadmium-silver bearings and the various types of oils. It was also pointed out that the film strength of extreme-pressure type lubricants could be greater than the mechanical strength of any of the common bearing metals, other than steel on steel, as in gears, so that high-film-strength or EP oils will not overcome fatigue types of failures in engine bearings.

Fleet Operator Bill Eaton discussed the possibilities of "prescription oils" to fill definite needs according to whether the same engines were used in passenger car service, or in heavy-duty service hauling trailers, or in other capacities.

Answering Mr. Beatty's question as to judging used oils by their colors, Mr. Georgi said that color is not a safe guide, except as to obvious dirt and carbon, and that a laboratory analysis is the safest guide. Neither is color a safe guide as to the quality of new oils, for some very excellent oils are dark in color even when new, he added.

One of the discussers explained that some idea as to what used engine oils contain might be had by placing a drop of the oil on the clean surface of a black enameled fender. If the oil contains lead, he said, this will give a grayish tinge against the black background, while the inclusion of water will give a brownish tinge. Oil that contains gum will be black and smelly, he added.

*In spite of icy streets and January weather, the dinner attendance was greater than expected, so that extra tables had to be set up in Webster Hall. Many participated in the discussion at the meeting which was held in the Mellon Institute auditorium.*

## Airframes Group Starts Work on Material Specs

How many of the 136 aircraft material specifications already set up by the Powerplant Committee of the SAE Aircraft Materials and Processes Subdivision can properly be adopted without change by the Airframes Committee? That was the first problem discussed at the organization meeting of the Airframes Committee late in January under the chairmanship of L. D. Bonham, Lockheed Aircraft Corp. J. B. Johnson, Materiel Division, U. S. Army Air Corps, who is chairman of the SAE Aircraft Materials and Processes Subdivision of the SAE Aeronautical Division, opened this important com-

mittee meeting by explaining that the Airframes Committee was designed to adapt existing specifications to the needs of airplane manufacturers and to set up such new materials specifications as the producers might need. Discussing methods of operations, he outlined the work already accomplished by the Powerplant Committee of his Subdivision under the leadership of H. Clements, Wright Aeronautical Corp. (See SAE Journal, January, 1941, p. 24).

With representatives of a majority of important aircraft manufacturing companies present, it was agreed at this organization meeting that the airframes materials specifications project is well worth carrying forward and that the cooperation of all airplane manufacturers and material suppliers would be solicited.

The committee began its active work at subsequent meetings held on days following the first gathering, when detailed study of the existing AMS steel specifications was undertaken. At this session a completed survey of steels used on the West Coast was made available to the Committee by H. Gledhill, Douglas Aircraft Co., as chairman of the Western Division of the National Aircraft Standards Committee.

Considerable practical progress was made at these meetings, particularly in refining specifications for stainless steels, and the groundwork was laid for continuing at an early date the activity on both engine and airframe material specifications.

### Representatives at Meetings

Present at these Pacific Coast meetings were: J. B. Johnson, U. S. Army Air Corps, chairman, SAE Aircraft Materials and Processes Subdivision; L. D. Bonham, Lockheed Aircraft Corp., chairman, Airframes Committee; B. Clements, Wright Aeronautical Corp., chairman, Powerplant Committee; E. Dudley, Curtiss Airplane Division, Curtiss-Wright Corp.; L. P. Spalding, and C. T. Torresen, North American Aviation Corp.; J. F. Cox, Vega Airplane Co.; R. E. Pelzel, R. A. Webster, H. Gledhill, E. E. Fess, and D. Haley, Douglas Aircraft Co.; R. B. Gray, Glenn L. Martin Co.; G. T. Waite, and R. A. Miller, Consolidated Aircraft Corp.; L. Cummaro, P. P. Mozley and Dr. V. N. Krivobok, Lockheed Aircraft Corp.; S. Rethorst, Vultee Aircraft, Inc., and C. E. Stryker, SAE Staff Representative.



L. D. Bonham, chairman, Airframes Committee on Materials Standards



## SAE Releases Stryker To Serve in OPM Post

Carleton E. Stryker, who has been in charge of the burgeoning SAE aircraft standards activities since July, 1940, has been released as a member of the SAE staff to serve in the Office of Production Management as coordinator of aeronautical standards for national defense. Appointment of his successor is expected shortly.

Meanwhile, the various committees comprising the Aeronautics Division of the SAE Standards Committee and the SAE Aircraft Brake Survey Committee continue to progress steadily in their vital defense work. Two committees now comprise the Aircraft Powerplant Subdivision of the SAE Standards Committee—the Aircraft Engine Committee and the Aircraft Propeller Committee. The Aircraft Engine Committee, under the chairmanship of Arthur Nutt, Wright Aeronautical Corp., is broadening its accomplishments in standardization of aircraft screw threads, involute spline fittings, and many other aircraft engine parts. Some time ago this committee completed the Aircraft Engine Testing Code. Erle Martin, Hamilton Standard Propellers, is chairman of the Aircraft-Propeller Committee which embraces standardization work relating to propellers.

With a projected 300 material specifications to write for use in the purchase and acceptance of aircraft materials, the Aircraft Materials and Processes Subdivision is almost at the half-way mark, with 136 specifications completed and now in widespread use and more than 150,000 specification sheets distributed. J. B. Johnson, U. S. Army Air Corps, is chairman of this Subdivision which is comprised of an Aircraft Powerplant Committee with B. Clements, Wright Aeronautical Corp., as chairman, and an Airframes Committee, chairmanned by L. D. Bonham, Lockheed Aircraft Corp. (For further information on the Airframes Committee, see p. 28). An Aircraft Accessories and Equipment Subdivision is handling standardization of aircraft accessories and equipment.

In addition to the important defense work of the Aeronautics Division of the SAE Standards Committee, an Aircraft Brake Survey Committee has been formed recently in cooperation with the National Research Council and National Defense Research Committee, of the Council of National Defense, to undertake a survey of the aircraft brake situation and to make recommendations for possible research aimed toward their improvement. (Details are given below).

## SAE Defense Committee To Survey Aircraft Brakes

In response to urgent requests by Air Corps officials for the development of aircraft brakes "which will permit greater energy to be absorbed per unit of rubbing surface," an Aircraft Brake Survey Committee has been organized. The new Committee held its first meeting February 10 at the Van Cleve Hotel, Dayton, O. The SAE accepted sponsorship for the Committee at the request of the Division of Engineering and Industrial Research of the National Research Council, to which the project has been assigned by the National Defense Research Committee of the Council of National Defense. Don R. Berlin, chief engineer, Curtiss Aeroplane Division, Curtiss-Wright Corp., has been made chairman.

The design and materials of aircraft brakes have become a critical problem in

# SAE Aeronautic Meeting



WASHINGTON HOTEL  
WASHINGTON, D.C.

MARCH 13 & 14

## PROGRAM

### AIRCRAFT ENGINE

Thursday morning, March 13

R. N. DuBois,  
Chairman

Compounding Facts and Fallacies—F. L. Prescott, U. S. Army Air Corps, Wright Field

Design of Air Scoops for Aircraft Carburetors—M. J. Kittler, Holley Carburetor Co.

Present Status of Combustion Research—Ernest F. Flock, National Bureau of Standards

### AIRCRAFT ENGINE

Friday morning, March 14

C. F. Bachle,  
Chairman

More Aircraft Engines for National Defense—Henry C. Hill, Wright Aeronautical Corp.

Cooling Characteristics of Submerged Light Aircraft Engines—H. A. Ellerbrock, National Advisory Committee for Aeronautics

### AIRCRAFT PROPELLERS

Thursday afternoon, March 13

R. C. Gazley,  
Chairman

Some Factors Influencing Aircraft-Engine-Propeller Vibrations—C. M. Kearns, Hamilton Standard Propellers, Division of United Aircraft Corp.

Considerations of the Design of Modern Aircraft Propellers—T. B. Rhines, Hamilton Standard Propellers, Division of United Aircraft Corp.

Vibration Characteristics of Three- and Four-Blade Propellers for High-Output Engines—R. M. Guerke, Curtiss Propeller Division, Curtiss-Wright Corp.

### AIRCRAFT

Friday afternoon, March 14

John G. Lee,  
Chairman

Icing Problems Attendant to the Operation of Transport Aircraft—R. L. McBrien, United Air Lines Transport Corp. (Motion picture and discussion—Allan A. Barrie, Western Air Express Corp.)

The Development of a New Lateral Control Arrangement—Paul Baker, Vought-Sikorsky Aircraft, Division United Aircraft Corp.

### DINNER

Friday evening, March 14

G. E. Reynolds,  
Chairman Washington Section

W. B. Stout,  
Toastmaster

A. T. Colwell,  
President SAE

Coordination of Aircraft Manufacture in Automobile Plants—C. C. Carlton, Automotive Committee for Air Defense

### LIGHT PLANES

Thursday evening, March 13

J. T. Gray,  
Chairman

Development of the Ercoupe—F. E. Weick, Engineering & Research Corp. (Prepared discussion—J. H. Geisse, Civil Aeronautics Administration)

Some Present-Day Problems in Light Airplane Engines—Ralph S. White, Civil Aeronautics Administration



the development of military aircraft because increasing landing speeds and weights of these ships require that their brakes must have increasingly higher braking capacities; yet they must be installed in a limited space and their weight must be kept to a minimum. This problem becomes particularly acute when the weight or landing speed of a military plane is increased beyond that of the original design, such as by replacing the original engine with a more powerful powerplant or by installing additional guns or armor.

Since there is no central source of information on aircraft brakes and little literature on the subject, it was decided that a survey of the existing state of aircraft brake design and operation should be the first step in the solution of the problem. The purpose of the Aircraft Brake Survey Committee is to conduct such a survey and to report the results, together with recommendations for brake improvement, to the National Defense Research Committee of the Council of National Defense, through the National Research Council. The Council of National Defense has requested that the Committee review the recent research and development directed toward increasing the braking capacity of mechanical brakes, including that on drum-type expanding, drum-type contracting or band, and disc types, and to make suggestions for the further development of mechanical brakes to obtain increased braking capacity and reduction of weight and space required for installation. Emphasis is to be placed in the study on the design of parts and selection of materials.

In its final report the Committee is expected to cover the following items:

1. A statement of the problem written from the viewpoint of the various interests: brake, wheel, and tire manufacturers; airplane manufacturers; airplane operators and regulating agencies; and manufacturers of equipment using brakes other than those for aircraft.
2. A review of recent research work and new developments on unconventional-type brakes, drum-type brakes, disc-type brakes, wheels, and tires.
3. A bibliography of existing literature in brake design, manufacture, installation, and maintenance.
4. A listing of existing research and testing equipment available for brake development.
5. A summary listing the present factors that limit brake development and a description of what is being done to extend these limits.
6. Recommendations for improvement of aircraft brakes.

#### Committee Personnel

Personnel of the SAE Aircraft Brake Survey Committee is as follows:  
 Don R. Berlin, chairman, Curtiss Aeroplane Division, Curtiss-Wright Corp.  
 C. E. Stryker, vice chairman and secretary, Office of Production Management.  
 H. A. Adams, Douglas Aircraft Co.  
 B. B. Bachman (for National Research Council), Autocar Co. (chairman, SAE National Defense Committee).  
 W. H. Du Bois, Bendix Products Division, Bendix Aviation Corp.  
 Maurice Holland, National Research Council.  
 Charles Hollerith, Hayes Industries, Inc.  
 E. K. Lasswell, U. S. Army Air Corps.  
 William Littlewood, American Airlines, Inc.  
 W. C. Mentzer, United Air Lines.  
 H. F. Schippel, Goodrich Tire & Rubber Co.  
 B. H. Shinn, Shinn Devices Co.  
 D. W. Tomlinson, Transcontinental & Western Air, Inc.



Don R. Berlin, chairman, Aircraft Brake Survey Committee

Jack Vitol, Civil Aeronautics Authority.  
 W. G. Wood, Lockheed Aircraft Corp.  
 C. H. Zimmerman, Goodyear Tire & Rubber Co.

The following Committee members attended the meeting in Dayton on February 10: Don R. Berlin, chairman, C. E. Stryker, vice chairman, W. H. Du Bois, Charles Hollerith, E. K. Lasswell, H. F. Schippel, B. H. Shinn, Jack Vitol, and C. H. Zimmerman; in their absence, H. A. Adams was represented by F. W. Herman of Douglas Aircraft Co.; W. C. Mentzer, by R. L. McBrien of United Air Lines; William Littlewood, by W. C. Lawrence of American Airlines, Inc.; and D. W. Tomlinson, by R. C. Loomis of Transcontinental & Western Air, Inc.

In addition, the following interested guests were in attendance: F. C. Frank, Bendix Products Division, Bendix Aviation Corp.; Capt. Victor Haugen, U. S. Army Air Corps; W. H. Hunter, B. F. Goodrich Co.; E. D. Monroe, Wright Field; F. D. Swan, Goodyear Tire & Rubber Co.; John A. C. Warner, Society of Automotive Engineers; and F. A. Wirth, U. S. Navy.

## 1939 Manly Medal at Smithsonian Institution

The Manly Memorial Medal for 1939, which was awarded Ernest Walter Hives and Frederick Llewellyn Smith, of Rolls-Royce Ltd., England, will soon be exhibited at the Smithsonian Institution, Washington.

Loaned to the Institution by the two Rolls-Royce engineers, the medal will be placed in the case containing the Manly-designed engine of the Langley airplane. The engine has been exhibited since 1918, and occupies a place on the main floor of the east hall of the Arts and Industries Building, directly below the position in the Langley airplane (suspended above) that it occupied when the airplane was launched in 1903.

The accession of the 1939 medal will permit the showing of its reverse side on which the engine is depicted. A blank medal presented by the Society some years ago shows the obverse side with a likeness of Mr. Manly.

Messrs. Hives and Smith were awarded the 1939 Manly Memorial Medal for their paper, "High-Output Aircraft Engines,"

which was presented before the SAE World Automotive Engineering Congress in May of that year. It was published in the March, 1940, SAE Transactions, pp. 106-118. Their paper deals particularly with liquid-cooled engines and interchangeable powerplants and engine mounts.

The label accompanying the Manly Memorial Medal will state briefly the reasons for its award and list the names of other recipients of the medal since its origin in 1928.

## Maintenance "Time Out" Halved by Butane Use

■ No. California

The fact that one Pacific Coast fleet has found that by converting gasoline trucks to butane-fueled units, maintenance hours have been cut down from 3 to 1½ per 10,000 miles, was one of the many interesting points brought out at the Northern California Section's Transportation & Maintenance meeting, Jan. 26. This experience was reported by Peter Glade, superintendent of transportation, Purity Stores, Ltd., in his paper, "Problems of Truck Fleet Maintenance." Sharing the program was J. H. Ritter, superintendent of maintenance, Pacific Motor Trucking Co., who spoke on "Operation and Maintenance of a Coordinated Rail-Truck Fleet."

Covering the operation of a fleet of diesel and butane-engine equipped trucks, Mr. Glade, in his paper, placed particular emphasis on the setting up of standard maintenance operations and periods at which they are to be performed. He described the program established by his company and the results obtained.

Commenting on the use of butane, which he believes merits the operator's investigation, Mr. Glade described it as a liquefied, hydrocarbon, non-poisonous, and non-corrosive fuel in the 100-octane range. "It requires some special equipment to convert a gasoline motor to its use," he stated, "but the cost of this equipment can readily be realized in the difference in fuel cost per gallon within one year, depending of course on the gallonage used." Continuing, he said, "butane being a dry gas has no carbon, which in turn means longer motor life. There is no diluting of crankcase oil, and it is not unusual to operate 11,000 miles before oil change is made. Valve grinds are not as frequent . . . we have cut maintenance hours from 3 to 1½ per 10,000 miles."

The Pacific Motor Trucking Co., said Mr. Ritter in his paper, is a subsidiary of the Southern Pacific Railroad, "created primarily to do for that company what it wants done in the way of highway operations." In doing this, he said, the PMT has established what is called "coordinated rail-line-truck-line" operations, wherein "coordination means the harmonized use of rail and highway facilities to produce the best transportation service for the least money." This system is used primarily for less-than-carload lots shipped at night by rail from Los Angeles, San Francisco, and Oakland to coordination centers in California, Arizona, Nevada, and Oregon where they are transferred to PMT vehicles which serve nearby communities the next morning, offering overnight service to all intermediate rail points in the area, no matter how small.

The PMT, Mr. Ritter explained, now operates 500 vehicles, of which 275 are power units. The types run from light service cars to heavy-duty, 3-axle, dual-drive, diesel units. Maintenance is done both at

company repair shops, in the larger cities, and at contract garages. The latter have authority to perform service and inspection work up to and including the 10,000-mile inspection and emergency repairs only. When major repairs become necessary, he said, contract garages must obtain special authority before proceeding, and when it is economical to do so, the equipment is transferred to a company garage for this work.

Mr. Ritter also explained the company's preventive maintenance system which, he said, "we believe has been the cause of an overall improvement of about one mile per gallon in fuel consumption for 1939 as compared with previous years. This improvement has been accomplished in spite of the fact that the average age of the fleet has increased. The money value of this fuel saving pays about 65% of the cost of all inspection work." Mr. Ritter also explained records maintained by his company by which two valuable comparisons can be made—cost per mile of any vehicle as compared with others in its group, and cost comparisons of different groups or makes of vehicles.

#### Discussion Brings Questions

Discussion, under the technical chairmanship of William Thomson, Marin Dairy-men's Milk Co., Ltd., was spurred by a series of questions by Sidney B. Shaw, Pacific Gas & Electric Co. Addressing both authors, he asked: "Do you inspect or repair some parts on a monthly or time basis rather than a mileage basis?" Mr. Glade answered that all his repairs and inspections are on a mileage basis regardless of time. Mr. Ritter stated that his maintenance schedules are on a mileage basis for trucks operating on long trips, while his pick-up-service trucks are overhauled on a yearly basis.

To Mr. Shaw's question about the use of Magnaflux method of inspection, Mr. Glade said that his company uses Magnaflux in checking for cracks in spindles and steering arms, and that continued use is expected to bring greater applications.

There has been no trouble experienced in starting supercharged diesel truck engines, said Mr. Glade in answer to a question by Salazar E. Onorato, Union Oil Co. He added that his company's trucks at times reach altitudes of 6000 ft and temperatures of 55 F. Mr. Glade, in answering another of Mr. Onorato's questions, described a series of tests he has made with various control rings in an effort to find the best balance between low oil consumption and freedom from scuffing and piston seizure.

Charles A. Winslow, Winslow Engineering, was told by both operators that it is too early for them to report on use of compounded lubricating oil and wide-base tires. Both are being tried experimentally. Answering another of Mr. Winslow's questions, Mr. Ritter said that all of the trucks in his fleet are equipped with oil filters and that drain periods for trucks in pick-up service are 2000 miles, and for trucks in long-haul service, 1000 miles.

"Under what conditions would a fleet operator change from diesel fuel to gasoline or butane?" asked William S. Crowell. Mr. Glade answered that in his opinion all long-haul work should be done by diesels, while short-haul trucking shows good results when using butane. Gasoline, he said, is used by his company in light-weight trucks in pick-up service. This difference in service conditions and size of trucks used in each type of service, said Mr. Glade in answer to a question by Mr. Onorato, prevents comparison between diesel and butane on a cost-per-ton-mile basis.

## Explains How Carburetor Meets Aircraft Demands

■ Washington

Listing icing, maneuverability, altitude, and metering as problems peculiar to aircraft-engine carburetors, M. J. Kittler, chief engineer, aircraft division, Holley Carburetor Co., told how these have been met in the development of a non-icing fully maneuverable aircraft carburetor, in his talk at the Washington Section's Jan. 14 meeting. In describing the carburetor, Mr. Kittler brought up to date his paper, "A Non-Icing Fully Maneuverable Aircraft Carburetor," which was published in the August 1939 SAE Journal, Transactions Section, pp. 357-364.

In regard to carburetor maintenance, Mr. Kittler revealed that these carburetors are overhauled at 600-hr intervals. Parts replacements have been reduced to a minimum, he said, by preventing lost motion in the throttle mechanism with take-up springs and thrust washers, by the prevention of corrosion by anodizing aluminum surfaces, and by the use of stainless steel. He also told of the development of a test bench with

which all functions of the carburetor except metering may be checked in the field.

During the discussion period, Mr. Kittler described a device, actuated by an electric vibrator, developed for checking the wear resistance of carburetor parts. This tool, he said, produces results in a matter of hours. The vibration frequency is of little importance as long as the destructive effect is obtained, he added.

In reply to a question by Dr. H. K. Cummings, Mr. Kittler reported that information of the performance of carburetors overseas is very meager but, as far as is known, the diaphragms are not injured by the fuel being used. He added that the diaphragms will withstand a 10% benzol fuel.

## Alden Speaks at Baltimore

"Diesel Fuel Injection" was the topic of Carroll R. Alden, research engineer, Ex-Cell-O Corp., when he spoke before the Jan. 16 meeting of the Baltimore Section. Calling on his experience in the development of diesel engines, Mr. Alden covered the field of fuel injection, particularly in connection with light-weight diesels which power many modern trucks.

## T&M Activity Sets Up New Committees In Organizing to Expand Its Program

THE SAE Transportation & Maintenance Activity Committee starts 1941 with an expansive program designed greatly to extend the Committee's accomplishments in five major divisions of its field. With the announcement of the new program, approved by the Council, T&M Vice President T. L. Preble stated that its aims are to establish closer relationship on mutual problems with the work of the Society's other Activity Committees, technical committees, and Sections. It is hoped, he added, that these groups will tie their work in with the Activity's program so that there may be two-way cooperation on projects which have joint interest.

The new organization set-up, he stated, will spread the Activity's work both geographically and vocationally, offering broader scopes of interests and more widespread opportunities for participation by members of the Society concerned with fleet operation and maintenance.

Specifically, the plan establishes under the T&M Activity Committee a central Transportation & Maintenance Coordinating Committee, under the chairmanship of H. O. Mathews, and five permanent project committees covering: *Special Public Utility Problems*—Randolph Whitfield, vice chairman; *Maintenance Control and Research*—S. B. Shaw, vice chairman; *Fleet Management Problems*—G. D. Gilbert, vice chairman; *Equipment and Design Factors*—E. P. Gohn, vice chairman; and *Special Bus Problems*—J. A. Harvey, vice chairman. Each of these vice chairmen plus A. M. Wolf, chairman of the Activity's Meetings Committee, and J. Y. Ray, who heads its Membership Committee, are members of the Coordinating Committee. The names of those serving on the project committees have not been announced as yet.

The purpose of the project committees is to undertake detailed studies on subjects assigned to them which have been selected from a list of 130 topics submitted by members of the T&M Activity Committee.

On the calendar for Committee "A"—

Special Public Utility Problems, are consideration of:

- Tractors for Off-Highway Work.
- Transportation for Moving Heavy Transformers.
- The Whole Subject of Mounted Air Compressors.
- Power Take-Off Driven Equipment (Compressors, Welders, Hole Diggers, etc.).
- Snow Plows on Utility Trucks.
- Committee "B"—Maintenance Control & Research will study:
  - Engine Deposits and Methods of Preventing and Removing Them.
  - Tire Maintenance Practices Including Retread and Puncture Seal Tubes.
  - Preventive Maintenance Practices Including Inspection Procedures.
  - Control of Service and Preventive Maintenance on Small Isolated Fleets.
  - Cleaning, Polishing and Painting.
  - Study of Frequency of Failures and Developing Form for Presenting to Management of the Manufacturers.
- On the schedule for Committee "C"—Fleet Management Problems are:
  - Training of Mechanics and Drivers.
  - When Equipment Should be Retired—Giving Comprehensive Results of Actual Surveys of Member Properties and Summarizing These Results by Types along with Original Data.
  - Garaging of Various Types of Fleets.
  - Company vs Outside Maintenance.
  - Procedures for Enhancing "Intensity of



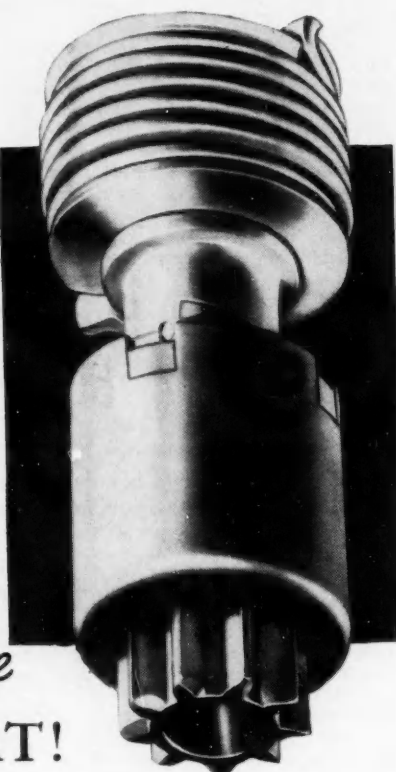
Usage" (work factor) of vehicles and vehicle pooling.  
 Develop Effective, Workable Safety Programs.  
 The agenda of Committee "D" - Equipment and Design Factors include:  
 Relative Merits of "Gadgets" such as Oil Filters, Air Cleaners, Defroster Units, Oil Rectifiers, etc.  
 Wheel Spacing Including Rim Sizes on Duals (for research leading to standards).  
 Engine Temperature Control.  
 Recommendations for Brake - Lining Testing.

Load Distribution Factors.  
 Minimum Torque Required for Gross-Vehicle-Weight Rating.  
 Design Elements as Affecting Safety.  
 Standardization of Storage Batteries and Carriers to Permit More Interchangeability.  
 Committee "E" - Special Bus Problems is slated to investigate:  
 Brake Maintenance Relative to Live Loads.  
 Air Conditioning and Ventilation.  
 Transmission and Clutch Systems.  
 Performance Testing.  
 Solve the Problem of Windshield Glare

from Interior Lighting - for Present Equipment as well as Future Production.  
 Solve the Mysteries of Static Charges on Buses and Develop Remedies.  
 Get Manufacturers to do More Toward Eliminating Vaporlock.  
 Set Up Standards for Location of Driver's Seat, Steering Wheel and Pedals, and Hand Brake in Buses to Make for Driver's Seat Comfort and Eliminate Awkwardness to Drivers Who Have to Change Frequently from One Type Bus to Another.  
 Each of the main project committees will have a subcommittee devoted to each of the topics on its agenda.  
 Aside from the above projects, work is to be continued on bumpers for trucks, based on a study already made by Past Chairman Gavin M. Laurie. The purpose of this undertaking is to obtain definite data upon which to base an SAE Recommended Practice to meet possible requests from regulatory bodies.



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## Modern High-Intensity Searchlights Described

■ Canadian

The Canadian Army's 60-in. searchlights which shoot 800,000,000-cp beams into the sky were described in detail before the Canadian Section's Jan. 15 meeting by R. M. Love, manager, lighting division, Canadian General Electric Co. Ltd. Mr. Love's illustrated address was sanctioned by the Army Division of the Canadian Department of National Defense.

The high-intensity electric arc, Mr. Love said, was discovered about 1914 and resulted in the development of a searchlight radically different from the solid-carbon-arc searchlight earlier in use. The essential feature of the high-intensity arc, Mr. Love explained, is a deep well-formed crater in the end of the positive electrode. To give a comparison of the operating temperature and intrinsic brightness of the high-intensity or cored-carbon arc as compared with the solid-carbon arc and also of the tungsten filament as used in the standard incandescent lamp, he presented the following table:

	Temp.	Brightness in cp per sq mm
Tungsten Filament	2600 C	20-40
Solid Carbon	3700 C	100-180
Cored Carbon	6000 C	500-1000

The meeting was attended by 70 members and guests of the section. Presiding was Section Chairman Norman Daniel who introduced the speaker and Roscoe Baker, McKinnon-Columbus Chain Co., host of the evening.

## Boor Addresses Students

■ Purdue

The general method of attack in gear design, actual production of the gear, and factors causing gear troubles and their remedies, were explained to members of the SAE Student Branch at Purdue University by F. H. Boor, chief engineer of the Fairfield Mfg. Co. The fifty students present were particularly interested in Mr. Boor's comments on his company's experiences in designing gears for rear-engine buses, for the turning controls on tractors, and for outboard motors. Mr. Boor illustrated his talk with sample gear-cutting tools and blueprints.

## Towle Scores Current Car Color Applications

■ Detroit

Sharp disagreement with current methods of applying two-tone coloring to the modern automobile was voiced before members of the Detroit Section, Society of Automotive Engineers, by Capt. H. Ledyard Towle, director of advertising and creative design, Pittsburgh Plate Glass Co. The meeting was held Feb. 3 at Hotel Statler.

In effect, he said that colors are being put on "upside-down" and he cited experiments made 15 years ago to prove that the light color should be on the body proper and the dark color on the roof and rear quarter. The current practice of using the light color on the top part of the body is diametrically opposed to principles demonstrated on the General Motors proving grounds in 1926, Capt. Towle said.

He also recommended the use of dark colors on wheels.

The objective of two-tone coloring is principally attainment of an apparent length of the vehicle. By this means a car which already looks long can be made to seem even longer.

Capt. Towle also criticized the appearance of some models which have a second color on fenders only, or on odd parts of the body. He recommended, as the one thing to be done to the car of 1942, design for the proper use of two, or even three colors.

Capt. Towle, originator of the first color advisory service in industry, has represented the DuPont company in such work and was Harley Earl's assistant when the Art and Color Section of General Motors Corp. was a newly started endeavor on the part of an automobile manufacturer to style cars to win public approval. As an industrial color expert, he has played an important part in the color styling of many products, including highway buses and automobiles.

A new approach to merchandising of automobiles for the public was suggested by Towle at this meeting.

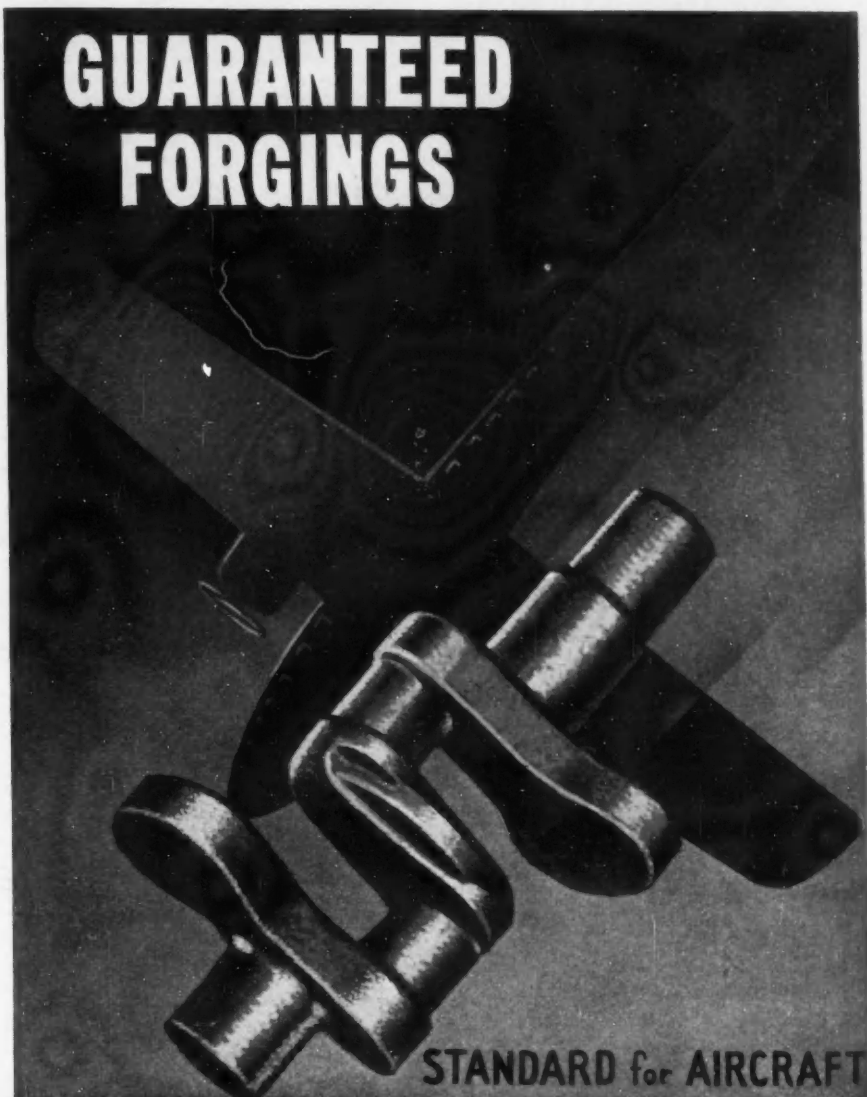
"When the new cars are announced," he said, "the public is interested mostly in price, improved performance and engineering gadgets, coupled with the new silhouette (if any). Color at that time is not so important." This interest in the new models prevails for at least four months, he asserted, at which time the public has become accustomed to the new cars and "has achieved a fair degree of 'front-end recognition' and an acquaintance with 'over-all silhouette'." He suggested that at this time the industry begin to introduce two tones of the same color, or two closely related colors. This, he said, would revive the interest of thou-

sands of drivers and pedestrians and this technique would be good for another four months of the model season.

About the time when talk of the next year's models became predominant and prospective buyers were beginning to think that perhaps they ought to wait until the new cars came out in the fall, "then let us begin to throw forward passes with color and to produce more color schemes, using less close harmony and more contrast," Towle suggested. By this means, undoubtedly, the late spring and summer buyers would be given a revived interest in purchasing automobiles.

Capt. Towle discussed in considerable de-

## GUARANTEED FORGINGS



STANDARD for AIRCRAFT

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tail the "pigment spectrum," listing primary colors, secondary colors and tertiary colors and, in addition, called attention to the "gray family" and the "brown-biege family." The color engineer in the automobile industry should master this color scale and should learn to make "color music" with it, Capt. Towle declared. In addition, the color engineer should have some conception of the human equation and color in its relation to the human eye.

Illustration of some of the effects of various color combinations was made by Capt. Towle who illustrated the "after image" affect and also demonstrated the way in which color affects the apparent size of objects. Considerable emphasis upon safety factors and their relationship to colors and color combinations was noted in his remarks.

In addition, he discussed at some length the front-end appearance of cars and the fact that some manufacturers this year, in their design of radiator grilles, belonged to the "tuck-them-behind-the-front-bumper" school. Of rear-end design he said that there are two principal classifications this year: the bold, convex design line, which he called the "extrovert," and the combination of two convex lines with a concave line dug into their middle, which he called the "introvert" motif.

## No. California Section Holds Annual Dinner Dance

The famous Gold Room of San Francisco's Fairmont Hotel was the scene of the Northern California Section's annual dinner dance, Feb. 8. More than 250 members, their wives and guests, had what was voted one of the most pleasant social affairs ever sponsored by the Section. Due credit for arrangements went to Secretary W. S. Crowell and those who worked with him on the dance committee.

## Small-Bore Diesel Engine Progress Traced by Rosen

■ Chicago

Design advance in small-bore diesel engines for tractors is a bright spot in automotive progress. This was the message of Diesel Researcher C. G. A. Rosen of the Caterpillar Tractor Co., who addressed the Feb. 4 Diesel & Tractor Meeting of the Chicago Section. The event was sponsored by the Section's Tractor & Industrial Power & Diesel Engine Activity which is headed by T. M. Robie, Fairbanks, Morse & Co., who served as technical chairman for the meeting.

Tracing the steps in development of small-bore diesel engines for tractors, Mr. Rosen told how the Caterpillar Tractor Co. developed its early small-bore designs for African sisal service and the South Seas, marine trading field. He recounted various stages of progress in this type diesel up to present-day types of high-performance diesel tractors. Design factors in fuel-injection systems, pre-combustion chambers, and fuel utilization, and how they have achieved progressive results for the small-bore type of compression-ignition engines, were also covered.

Since the difficulties in small-bore design increase greatly with the reduction in bore, a point stressed by commentators in the after-paper discussion, the speaker emphasized how, despite the differences in design among diesel engine makes, the trend in design features is definitely towards better fuel combustion generally and greater uniformity in and availability of diesel fuel,

with corresponding higher standards of performance.

In early production of the 3 3/4-in. bore Caterpillar diesel tractor engine, Mr. Rosen stated, higher initial cost, because of limited production volume, somewhat militated against user acceptance. But, he added, as application of the diesel-powered tractor clearly demonstrated such large fuel savings over carburetor-spark-ignition type tractors,

## Government Asks SAE Cooperation

In recent months members of the Society of Automotive Engineers have been asked by the National Roster of Scientific and Specialized Personnel (jointly administered by the National Resources Planning Board of the Executive Office of the President and the United States Civil Service Commission) to answer a general questionnaire and technical check list so that there may be in Washington a central register of persons professionally competent in the field of automotive engineering.

This is an important part of the national defense program, because it provides information as to the special skills and present activities of individuals, which may be readily available for consideration in connection with consulting and other national defense posts.

Another extremely important aspect of the roster is application of the material it contains to prevent the withdrawal of men engaged in work important to the national defense program for other services where their work would be of less value to the nation.

The Society has cooperated with the National Roster offices in developing and mailing the check list, and is continuing cooperation in its utilization for national defense purposes.

Every SAE member who has not yet filled out his questionnaire and technical check list is urged to do so. If yours has been mislaid, additional copies may be obtained by writing to James C. O'Brien, executive officer, National Roster of Scientific and Specialized Personnel, National Resources Planning Board, Washington, D. C. In writing, state that you desire the Automotive Engineering Technical Check List.

the market possibilities developed rapidly to where there is a peak demand today for tractors powered by small-bore diesel engines.

Discussing diesel engine performance and maintenance factors, Mr. Rosen pointed out how blowby evils are being reduced and how greater freedom from carbon deposits, due to varying oil characteristics, is being obtained through improved combustion and better fuel utilization. A point was made of the fact that the pure air blowby on the compression stroke is as responsible for lubrication difficulties as the action of the expanding gases on the power stroke.

To illustrate performance trends and maintenance characteristics of small-bore diesels, Mr. Rosen used numerous slides. He showed a variety of fuel consumption curves

and designs for different injection and combustion-chamber type engines, illustrating clearly how design variation, as indicated in high-pressure multiple-spray injection systems, open-chamber systems and direct-injection and other types, affect performance and maintenance in field operations. Other slides were shown to illustrate the effect of heat absorption in bearings and the improvement which has been obtained by use of thinner linings.

In the after-paper discussion, led by Chairman Robie, speaker Rosen, who is past SAE Fuels & Lubricants vice president and present chairman of the Automotive Diesel Fuels Division of the Cooperative Fuels Research Committee, told how in an advisory capacity to the Military Services, the CFR committee has been able to contribute significantly to the formulation of specifications for a universal diesel fuel suitable for mobile Army and certain high-speed Navy equipment.

In the discussion Mr. Rosen cited 35-cetane-number diesel fuel as the lowest for satisfactory use in 3 3/4-in. bore diesels under average performance conditions, with 45-cetane-number fuel necessary for operation in higher altitudes. H. G. Smith, Buda Co., emphasized that in spite of differences among the manufacturers in point of combustion-chamber and engine design, economy of diesel fuel operation, even with tax included, gives the diesel a marked advantage which forecasts much wider use.

The need for better combustion control as a vital essential for greater flexibility and range of the diesel was stressed by Harry Bryant, International Harvester Co. Other commentators included R. H. Colvin, Burd Piston Ring Co., E. R. Barnard, Standard Oil Co. of Ind., and J. A. Watts, Cummins Engine Co.

## Suggests Care in Use of Stress Formulas

■ Buffalo

That ordinary stress formulas do not rigidly apply in a piece of machinery, and should be used only as a starting point for calculations, was the stand taken by Richard Templin, head of the Aluminum Co. of America's material testing laboratories, in his talk before 65 members and guests of the Buffalo Section, Dec. 11.

The measured stress in a test specimen, he said, is based upon its original cross-section area, and is actually much higher than given values when based on the reduced area at the yield point.

Aluminum, he noted, follows theory much more closely than steel, due to such phenomena as work hardening of steel in test specimens.

## Student Branch Advisor Named

■ U. of Oklahoma

The SAE Student Branch at the University of Oklahoma starts the second semester with the advisory service of E. E. Scott, superintendent of motor equipment, Oklahoma City. Mr. Scott, who is membership chairman of the SAE Tulsa Group, accepted this post succeeding Prof. D. O. Nichols, Jr., who was called to military service. Prior to the start of the school year, Prof. C. N. Paxton, who had been advisor to the Student Branch, left the University to accept a commission in the Navy.

Members of the Branch held a special meeting Feb. 10 to welcome Mr. Scott as their advisor.





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